

# Middletown Township

Bucks County ■ Pennsylvania

## Fire Services Study

September 2021



**DYNAMIX**  
CONSULTING GROUP



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# 1. EXECUTIVE SUMMARY

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## Background

On March 17, 2021, Middletown Township in Bucks County, Pennsylvania contracted Dynamix Consulting Group to conduct a *Fire Services Study*. The purpose of the study was to assess the current delivery of fire protection services to the community and offer possible changes pursuant to industry standards and best practices.

The Scope of Work for this study included, but was not limited to, conducting a review and making recommendations related to staffing, training, data management, equipment, apparatus, facilities, intergovernmental cooperation, and funding. The focus of this project was to evaluate the fire services in Middletown Township as a whole. For this reason, analyses are cumulative unless there is a specific reason to differentiate by fire company. As part of the data discovery process, Dynamix Consulting Group met in person with the leadership and members of each the Langhorne-Middletown Fire Company, Parkland Fire Company, Penndel Fire Company, William Penn Fire Company and Middletown Township Department of Fire and Emergency Management.

While the Penndel-Middletown Emergency Squad was not a focus of the *Fire Services Study*, Dynamix Consulting Group met with the leadership of the Emergency Squad as they play a vital role in the response to emergencies within the Township. Dynamix further reviewed emergency response and financial data for the Penndel-Middletown Emergency Squad to suggest potential opportunities for collaboration and efficiencies that could benefit the Township, volunteer fire companies, and emergency squad.

## Summary Findings

The fire services in Middletown Township – comprised of four volunteer fire companies and the Township Department of Fire and Emergency Management – are historically proud and very traditional organizations that recently find themselves challenged to respond to an increasing number of emergency calls with a decreasing number of volunteer firefighters.

Dedicated people make up the fire services in Middletown Township, both volunteer and paid, who provide a critical service to the community. Following more than three dozen meetings, interviews, and phone calls with stakeholders throughout the community, Dynamix Consulting Group finds the fire service in Middletown as a whole is in the midst of an identity crisis while simultaneously suffering from strained relationships resulting from a lack of communication, which in turn has created a system-wide lack of trust.



This *Fire Services Study* offers a variety of recommendations to improve the safety of firefighters within Middletown Township and improve the service provided to the community. Dynamix Consulting Group notes that the fire services in Middletown Township must define itself and establish a baseline level of trust and communication between the Township and the volunteer fire companies before any of the other recommendations in this study can be implemented successfully.

## The Identity of the Fire Services in Middletown Township

In 2005, the International Association of Fire Chiefs Volunteer and Combination Officers Section issued *The Red Ribbon Report: Lighting the Path of Evolution: Leading the Transition in Volunteer and Combination Fire Departments*. This report detailed the difference between “combination” and “dual” fire departments.

A combination fire department is one where career and volunteer firefighters are “combined” into a single system to provide fire and emergency response to the community. The volunteer and paid members of the fire service work together in a combination system.

A “dual” fire department is one in which career firefighters are segregated from volunteer firefighters and there is little cooperation and integration between the two. The defining characteristic of a dual fire department is a clear separation between the volunteer and paid members of the fire service that essentially creates two “dual” systems.

The Red Ribbon Report lists the following characteristics as being indicative of a dual fire department.

Characteristics of a Dual Fire Department
Volunteers operating in different quarters than paid staff.
Volunteers riding on separate apparatus than paid staff.
Separate rules and regulations are used.
One group receives better equipment and apparatus than the other does.
Rank structures and supervision are not integrated.
No opportunity for social interaction.



Within the *Organizational Planning* section of this report, Dynamix Consulting Group highlighted the importance of establishing a current mission statement, values statement, and organizational values. As part of this process, the fire services in Middletown Township must determine its current and future identity and to answer these questions:

1. Do the fire services in Middletown Township endeavor to be a volunteer, career, dual, or combination fire department?
2. Is the ultimate goal to be a career fire service supported by volunteer firefighters or a volunteer fire service supported by career firefighters?
3. Is the Township better served by one unified system of fire service delivery comprised of multiple fire companies or by four fire companies that are completely autonomous and independent of the Township?

As the fire service is a dynamic environment, the answers to these questions will likely change over time, thus requiring the fire services in Middletown Township to regularly evaluate, potentially update, and then reaffirm its mission statement, vision statement, and organizational values. The fire services in Middletown Township should evaluate, update, and reaffirm to ensure the deployment of appropriate resources, albeit limited, to satisfy the fire services' mission and priorities.

It is imperative that all levels of the organization, from the newest firefighter to the Township's elected officials, understand the mission and priorities of the fire services in Middletown Township. Common understanding ensures decisions made at all levels consistently possess the same focus and priorities.

## Trust and Communication

Feedback received by Dynamix Consulting Group from members of the fire services in Middletown Township, both during in-person meetings and through the anonymous survey, identified a lack of trust and communication as the major threats to the future success of the fire services in Middletown Township.

Members of the fire services in Middletown Township recognize that their dedication to serving the community is by far the greatest strength of the system. Members further cited the commitment, diversity, training, and equipment as sources of pride of the fire services in Middletown Township.

There is, however, a widespread feeling among both the volunteer firefighters and paid Fire Code Inspectors that the fire services in Middletown Township requires an immediate intervention. Years of strained relationships resulting from poor communication have left both the volunteer



firefighters and paid Fire Code Inspectors tired. Dynamix Consulting Group heard in each of the four volunteer company meetings, as well as at the paid Fire Code Inspectors meeting, members share that they were actively considering quitting the fire services in Middletown Township because they did not want to deal with the fire service drama anymore. Dynamix Consulting Group repeatedly heard from individuals at every meeting that they considered this *Fire Services Study* to be the “last chance” to fix the fire services in Middletown Township before more people quit and the volunteer fire companies became unsustainable.

Relationships between the four volunteer fire companies and the Township have been strained and sometimes unproductive in recent years. The four fire companies and the Township must re-establish trust and communication before the fire services in Middletown Township will be capable of working toward improving operations and implementing the recommendations in this report.

While the volunteer firefighters have stood up to the challenge of increased call volume and a decrease in volunteers in recent years, they will need additional support from the Township in the future to be able to continue to serve the community. This support will most likely be in the form of additional paid firefighters. By working with the leadership of the four volunteer fire companies to create a system that includes additional paid firefighter positions, the Township can help to keep the job of the volunteer firefighters “manageable” thus helping the volunteer firefighters maintain a viable volunteer firefighting force for as long as possible.

Dynamix Consulting Group strongly suggests that it is in the best interest of Middletown Township to take an active lead engaging the four volunteer fire companies to develop a coordinated combination system for the fire service within the Township. Trends nationally, within the Commonwealth, and within the Township indicate declining numbers of volunteer firefighters. It is the opinion of Dynamix Consulting Group that this trend will continue, but that the Township can have a direct impact on the rate at which this decline occurs within Middletown Township. Dynamix Consulting Group will offer a series of options for the future organizational structure of the fire services in Middletown Township in the *Long-Term Opportunities and Short-Term Recommendations* section of this report.



## 2. INTRODUCTION

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### Acknowledgements

Dynamix Consulting Group would like to thank Middletown Township elected and appointed officials as well as the leadership and members of the:

Langhorne-Middletown Fire Company  
Parkland Fire Company  
Pennel Fire Company  
William Penn Fire Company  
Pennel-Middletown Emergency Squad

This project would not have been possible without their cooperation and support.

### Project Initiation

Using organizational, operational, staffing, and geographic information system (GIS) models, this evaluation provides a comprehensive appraisal of the emergency operations of the fire services in Middletown Township as it was found upon Dynamix Consulting Group's completion of fieldwork and data collection in June 2021. Dynamix Consulting Group based this evaluation on data provided by the Township and the volunteer fire companies as well as data collected during fieldwork. The information is mirrored against a combination of Pennsylvania laws and regulations, National Fire Protection Association (NFPA) standards, Commission on Fire Accreditation International (CFAI) self-assessment criteria, health and safety requirements, federal and state mandates relative to emergency services, and generally accepted best practices within the emergency services community, as well as the experience of Dynamix Consulting Group's consultants.<sup>1, 2</sup>

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<sup>1</sup> NFPA, National Fire Protection Association is a standard developing organization. Standards developed by NFPA are "voluntary consensus standards," created through procedures accredited for their consensus decision-making, openness, balance of interests represented, and fairness by the American National Standards Institute (ANSI).

<sup>2</sup> The CFAI organization is now a subsection of the Center for Public Safety Excellence (CPSE) but maintains its prime function of accrediting fire agencies.



## Stakeholder Input

The Dynamix Consulting Group project team conducted more than three dozen virtual and in-person interviews, meetings, and facility tours to gather information from key stakeholders to provide context for the recommendations identified within this study. The purpose of these interviews was to gain an understanding of the current issues, concerns, and opinions related to the fire services in Middletown Township. General topics discussed during each interview included:

- Perceived strengths and weaknesses of the current system
- Identified strengths and weaknesses of the current system
- Opportunities for enhancement to the current system
- Future challenges that may warrant attention

Dynamix Consulting Group interviews with fire services in Middletown Township stakeholders included, but were but not limited, to the following individuals:

Stakeholder Input
Township Elected Officials
Township Appointed Officials
Township Directors and Key Staff
Leadership from all four Volunteer Fire Companies
Members from all four Volunteer Fire Companies
Township Fire Service Leadership
Township Fire Code Inspectors
Emergency Medical Services Partners
Leadership from the Boroughs of Langhorne, Langhorne Manor, Penndel and Hulmeville

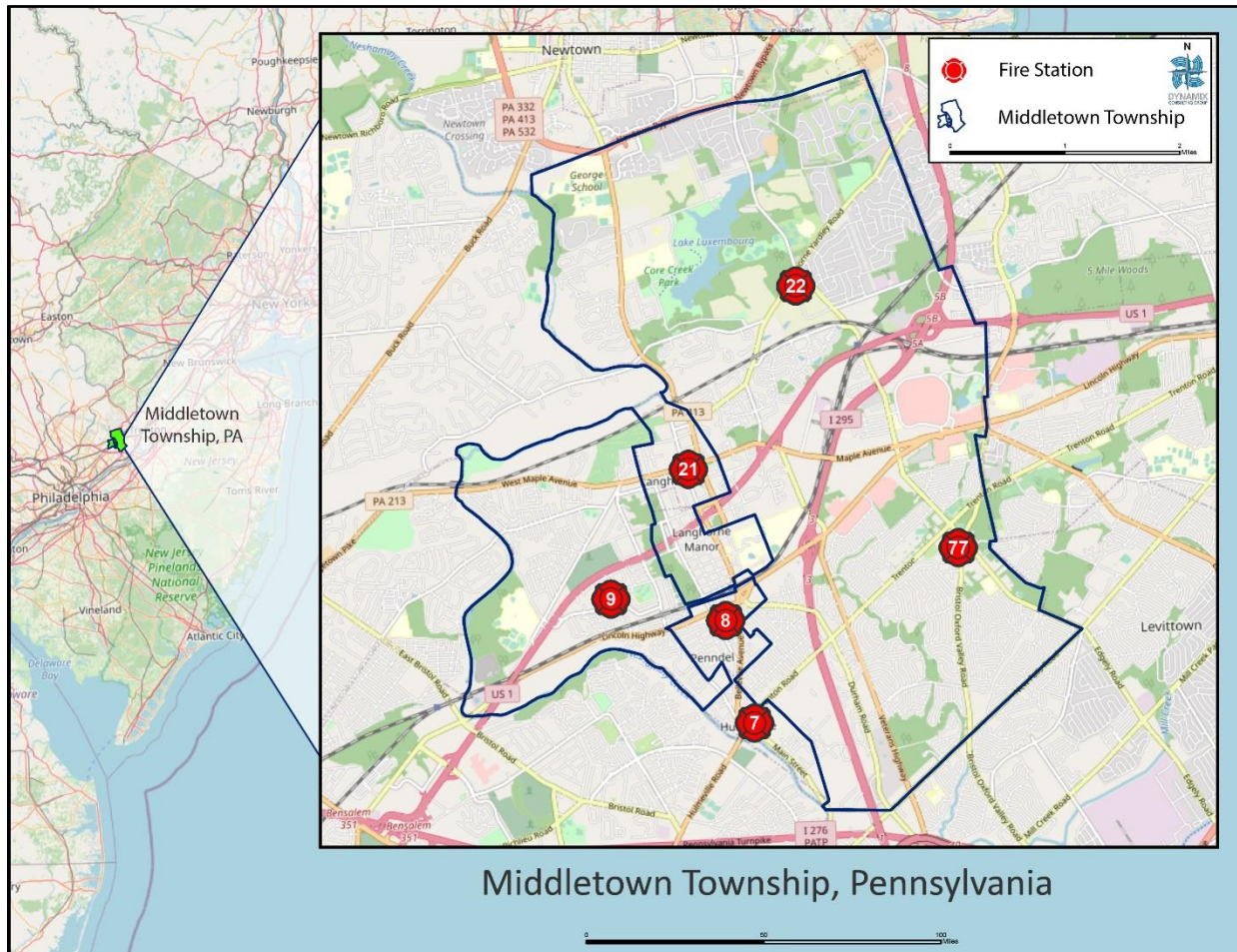




### 3. ORGANIZATION OVERVIEW

Middletown Township, located in Bucks County, Pennsylvania, formally established in 1692. Situated midway between Philadelphia, Pennsylvania and Trenton, New Jersey, the Township is one of the oldest municipalities in the County.

Middletown Township, Bucks County, Pennsylvania





The Township encompasses an area of 19.4 square miles, bordered by the following 11 municipalities:

Municipalities Bordering Middletown Township
Newtown Township
Lower Makefield Township
Falls Township
Bristol Township
Bensalem Township
Lower Southampton Township
Northampton Township
Borough of Langhorne
Borough of Langhorne Manor
Borough of Penndel
Borough of Hulmeville

Interstate 95, United States (U.S.) Route 1, U.S. 30 (Lincoln Highway), State Route (S.R.) 2033 (Woodbourne Road), S.R 413 (Newtown-Langhorne Road), S.R. 2130 (Maple Avenue) S.R. 2049 (Langhorne-Yardley Road) and Trenton Road traverse the Township. Major commercial and institutional establishments in the Township include Sesame Place Theme Park, Oxford Valley Mall, and St. Mary Medical Center.

## Service Area Population & Demographics

All demographic information provided in this section is from the Environmental Systems Research Institute (ESRI) as of 2021 based on US Census and American Community Survey (ACS) data as well as proprietary sources. ESRI is an international supplier of geographic information system software, web GIS and geodatabase management applications.

<b>Population</b>	<b>16,855</b>
<b>44,956</b>	<b>Households</b>
Population	

Middletown Township has a population of 44,956 residents living in 16,855 households. Within the Township are 28,698 employees who work for 1,658 businesses, resulting in a daytime population of 45,971 people.



The Township is comprised of a predominately middle aged and educated population; the median age is 44.3 years old, and more than a quarter—25.5%—of the township’s residents are “Baby Boomers” who were born between 1946 and 1964 and are currently between the ages of 57 and 75 years old.

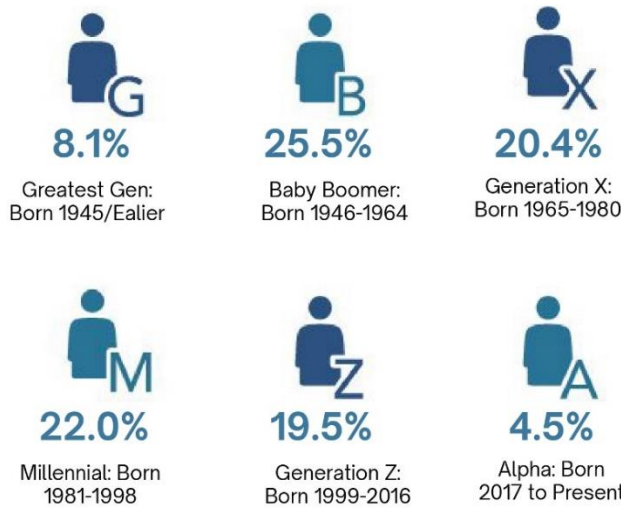
### Daytime Population and Businesses



The second most prominent age group within Middletown Township are “Millennials.”

Born between 1981 and 1998, today, Millennials are between the ages of 23 and 40 years old and raising families. The Centers for Disease Control and Prevention (CDC) states this group has the highest risk of death caused by unintentional injury; however, Millennials are difficult to target for injury and fire prevention programs because of occupational obligations and a decline in community participation. In the last two decades, the United States has seen a decline in people engaging and volunteering in their community, especially in fire departments and social clubs.<sup>3</sup>

### Population By Generation



Middletown Township is Generation X, which is the generation in between the Baby Boomers and the Millennial Generation. Generation X comprises 20.4% of Middletown Township population.

The population within Middletown Township is educated with 67% of the population having attended at least some college and 42%

### Education



<sup>3</sup> *Where are America’s Volunteers? A Look at American’s Widespread Decline in Volunteering in Cities and States. October 2018.*  
[https://publicpolic.umd.edu/sites/default/files/UMD\\_DO%20Good\\_Where%20Are%20Americas%20Volunteers\\_Oct2018.pdf](https://publicpolic.umd.edu/sites/default/files/UMD_DO%20Good_Where%20Are%20Americas%20Volunteers_Oct2018.pdf)



having earned a Bachelor’s, Graduate or Professional Degree.

The median household income in the township is \$98,970. The per capita income is \$44,760 and the median net worth is \$349,782.

The majority of the population within Middletown Township maintains health insurance, with 3.5% having no insurance.

### Income



### Insurance

	19<	19-34	35-64	65	
 Has One Type Of Health Insurance	19.3	18.9	36.1	4.5	
 Population (2014-2018)	20.4	20.8	40.5	18.4	%
 No Health Insurance	0.4	1.4	1.7	0.0	
Population Age	19<	19-34	35-64	65	

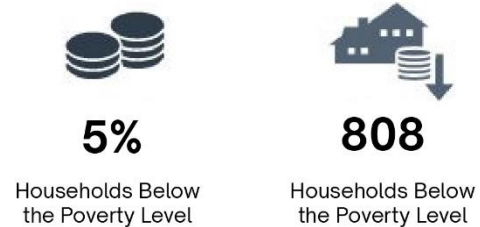
### At Risk Populations

Often defined very broadly, the term “populations at risk” does not include all citizens within a defined group, as they experience risk at varying levels or rates. Coupling two or more risk factors contributes to significantly higher levels of risk than those who only experience one risk

category. Those with compounded risk factors should be a priority in prevention programs and strategies.

Broadly, populations at risk include citizens at the lower end of socioeconomic status, those with housing and transportation challenges, those of minority status or who do not speak English, and households containing citizens with disabilities, over 65 and under 17 years of age. More specifically, citizens most at risk include the impoverished, disabled, homeless, racial, and ethnic minorities, as well as people with low literacy. Also, groups suffering from poor health or who are uninsured/underinsured may be at greater risk during emergency or disaster situations.

### Poverty



There are several causal factors determining the population of at-risk individuals or groups within a community. Understanding the causal factors and populations of the community that are at greatest risk provides insight into content for programs and prevention efforts to address higher risk factors and reduce the effects of the associated risks. These factors



also are important to consider when calculating demand for fire and emergency services within the community.

**Disabled, Elderly and No Vehicles**



There are 808 households in Middletown Township that exist below the poverty level; this represents 5% of the households in the Township. Other individuals potentially at risk within the township include the disabled, those over the age of 65, and households without a vehicle. According to ESRI,

3,866 households in the township include an individual with a disability. This is almost a quarter - 22.94% - of the Township's 16,855 households. The Township's population includes 9,413 residents over the age of 65 years old and 764 households without a vehicle. While there are a variety of languages spoken within Middletown Township, only 63 residents report not to speak any English.

**Languages Spoken**

Language Spoken (ACS)	Age 5-17	18-64	Age 65+	Total
<b>English Only</b>	<b>5,732</b>	<b>24,770</b>	<b>7,566</b>	<b>38,068</b>
<b>Spanish</b>	<b>334</b>	<b>822</b>	<b>127</b>	<b>1,283</b>
Spanish & English Well	318	731	110	1,153
Spanish & English Not Well	16	91	8	115
Spanish & No English	0	0	9	9
<b>Indo-European</b>	<b>245</b>	<b>1,373</b>	<b>528</b>	<b>2,146</b>
Indo-European & English Well	245	1,260	367	1,872
Indo-European & English Not Well	0	104	133	237
Indo-European & No English	0	9	28	37
<b>Asian-Pacific Island</b>	<b>84</b>	<b>814</b>	<b>104</b>	<b>1,002</b>
Asian-Pacific Island & English Well	80	707	87	874
Asian-Pacific Island & English Not Well	4	107	0	111
Asian-Pacific Island & No English	0	0	17	17
<b>Other Language</b>	<b>10</b>	<b>178</b>	<b>9</b>	<b>197</b>
Other Language & English Well	10	173	9	192
Other Language & English Not Well	0	5	0	5
Other Language & No English	0	0	0	0

**Housing Type and Density**

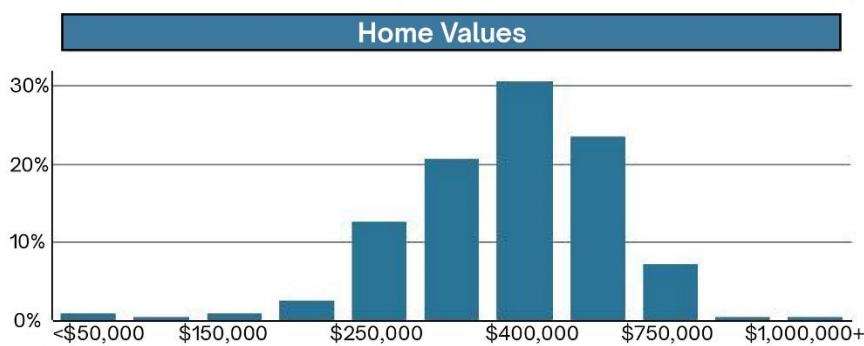
An important indicator of the risk in the community involves property value, occupancy rate, and ownership status of homes in the community's neighborhoods. Often, homes with lower value, vacant homes, and rental properties are maintained and repaired less often than those in higher-value categories. Conversely, in order to maintain and improve property value of owner-occupied homes, owners maintain and repair their properties at higher levels.

According to NFPA, the top five causes of fatal fires (which account for 90% of fire deaths) are cooking, heating, electrical, intentional, and smoking. Fires of these types occur in all residence types and should be foundational in fire prevention campaigns aimed at homeowners and renters alike.



Fire suppression systems (fire sprinklers) are time-proven life-saving devices, with more than 125 years of empirical data serving to document their effectiveness. However, in the United States, fire sprinkler systems remain elusive in residential properties, especially in one-and two-family dwellings.

In residential properties, 36.6% heat with natural gas, propane, or wood. These residences face increased risks of carbon monoxide poisoning compared to all-electric homes found in much of the community. Education programs regarding carbon monoxide poisoning prevention, heating and cooking appliance maintenance, and carbon monoxide detector use would benefit these residents.



The median value of owner-occupied homes in Middletown Township is \$338,688, but approximately 60% of the homes are valued at \$400,000 or more. This information is important to the overall

understanding of the community as it provides insight into the income and preferences of the community’s residents.

A 2021 NFPA Study found that the death rate per 1,000 home structure fires is 55 percent lower in homes with working smoke alarms than in homes with no alarms or alarms that fail to operate<sup>4</sup>.

A 2008 study prepared for the Centers for Disease Control<sup>5</sup> and Prevention of lithium battery-powered smoke alarms installed in 1998–2001 in five states investigated whether these alarms were present and operational eight to ten years later.

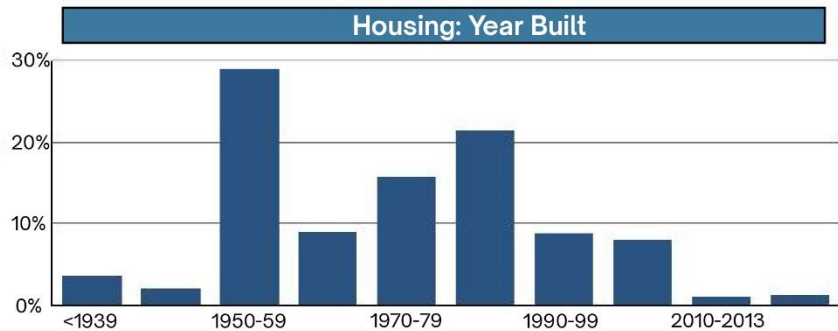
This study found that at least one of the installed alarms was still present and functional in only 38 percent of the homes visited. Slightly more than one-third (37%) of the installed alarms had been removed, one-third (33%) were present and operational, and slightly less than one-third (30%) were present but not operational.

<sup>4</sup> [Smoke Alarms in US Home Fires \(nfpa.org\)](https://www.nfpa.org)

<sup>5</sup> [Evaluation of the “10-Year” Smoke Alarm Project \(nchharchive.org\)](https://www.nchharchive.org)

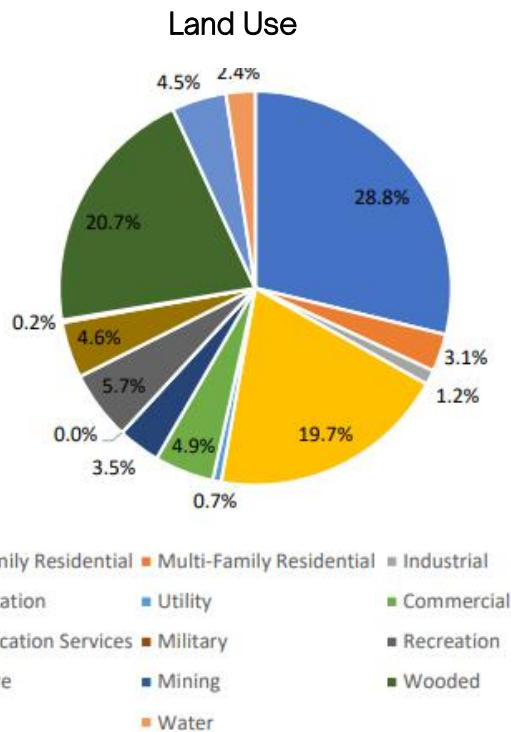


Among the residential housing units in Middletown Township, approximately 95% were constructed prior to the year 2000. The aging home demographic within the Township provides a need for focused Community Risk Reduction efforts related to smoke detectors within the community.



## Land Use

At 29% of its acreage, the highest proportion of Middletown Township’s land use is single-family residential development. The next highest proportions of land use are wooded land including parks, greenways, and open space (21%) and transportation, which includes roads, streets, and parking lots (19.7%). Commercial occupancies account for 4.9% of the land use within Middletown Township.<sup>6</sup>



<sup>6</sup><https://www.middletownbucks.org/Resources/Documents-Forms/Administration/Comprehensive-Plan-2020-%E2%80%93-Final>



## Governance

### Second Class Township

Middletown Township is a Second Class Township. The designation of a Second Class Township outlines the powers granted by the Commonwealth of Pennsylvania to the Township. Middletown Township's authority is restricted to those powers specifically authorized by the Commonwealth.

In Pennsylvania, every citizen lives in a school district, a county, and a municipality. School districts provide education. The county provides elections, social services, the court system, and land use planning. Municipalities, which include Townships of the first and second class, boroughs, cities, home rule municipalities, and towns are primarily responsible for public infrastructures such as roads and water systems. Municipalities are also the primary providers of public safety services including fire, police, and ambulance services.

The Second Class Township Code, which is the Commonwealth law that empowers Townships of the second-class, sets out this form of government and delegates certain mandatory responsibilities to Townships, as well as the authority to levy taxes, provide optional services, and enact certain regulations. In 2008, the Second Class Township Code amendments clarified that the Board of Supervisors is responsible for the provision of fire protection within the Township.

Title 8 of the Pennsylvania Consolidated Statutes establishes similar responsibilities and authorities for boroughs.

#### [Second Class Township Code, Act 69 of 1933](#)

**Section 1553. Emergency Services.** — (a) The Township shall be responsible for ensuring that fire and emergency medical services are provided within the Township by the means and to the extent determined by the Township, including the appropriate financial and administrative assistance for these services.

(b) The Township shall consult with fire and emergency medical services providers to discuss the emergency services needs of the Township.

(c) The Township shall require any emergency services organizations receiving Township funds to provide to the Township an annual itemized listing of all expenditures of these funds before the Township may consider budgeting additional funding to the organization.

(1553 added Mar. 17, 2008, P.L.47, No.7)





As it relates to Fire Protection, the Second Class Township Code provides for the following:

**Section 1801. Authority of Board of Supervisors.** —The Board of Supervisors may provide for fire protection within the Township.

**1803. Fire Companies, Facilities and Training.**—(a) The Board of Supervisors may appropriate moneys for the use of the Township or to fire companies located in the Township for the operation and maintenance of fire companies, for the purchase and maintenance of fire apparatus, for the construction, repair and maintenance of fire company houses, for training of fire company personnel and, as set forth in this section, for fire training schools or centers in order to secure fire protection for the inhabitants of the Township. The fire companies shall submit to the Board of Supervisors an annual report of the use of the appropriated moneys for each completed year of the Township before any further payments may be made to the fire companies for the current year.

(b) The Board of Supervisors may by ordinance make rules and regulations for the government of fire companies which are located within the Township and their officers.

(c) The Board of Supervisors may contract with or make grants to near or adjacent municipal corporations or volunteer fire companies therein for fire protection in the Township.

(d) No volunteer fire company not in existence in the Township before the effective date of this act may organize or operate unless the establishment or organization is approved by resolution of the Board of Supervisors.

(e) The Board of Supervisors may annually appropriate funds to fire companies located within the Township for the training of its personnel and to lawfully organized or incorporated county or regional firemen's associations or an entity created pursuant to the act of July 12, 1972 (P.L.762, No.180), referred to as the Intergovernmental Cooperation Law, to establish, equip, maintain and operate fire training schools or centers for the purpose of giving instruction and practical training in the prevention, control and fighting of fire and related fire department emergencies to the members of fire departments and volunteer fire companies in any city, borough, town or Township within this Commonwealth.



## Council Manager Form of Government

Middletown Township incorporated as a “council-manager” form of government. The official governing body of the Township is the Board of Supervisors. The Board of Supervisors is responsible for appointing the Township Manager. The Township Manager directs and coordinates the activities of the various departments of local government and serves as the administrator of municipal affairs.

## Middletown Township Code of Ordinances

Middletown Township Code of Ordinances establishes the Office of the Fire Marshal.

### **§ 62-200 Office of Fire Marshal created.**

The office of Fire Marshal is hereby created in the Township of Middletown; such officer to be appointed by the Township Manager. The Fire Marshal shall report to the Township Manager except on those matters of which he is required by law to report directly to the Board of Supervisors.

### **§ 62-201 Appointment; compensation; powers and duties.**

The person appointed to the office of Fire Marshal shall be appointed as soon as practicable after the adoption of this article. The aforesaid appointment notwithstanding, the Township Manager retains the right to remove the Fire Marshal at his or her pleasure. Vacancies shall be filled in the same manner as the original appointment was made. If for any reason this office is not separately filled by appointment of and with the approval and consent of the Board of Supervisors, the Fire Chief shall be deemed the ex officio Fire Marshal thereof and shall have all the powers and duties hereinafter given to or imposed upon the Fire Marshal. Compensation of the Fire Marshal shall be fixed from time to time by the Board of Supervisors pursuant to resolution. The Fire Marshal shall perform all duties and shall have and exercise all powers prescribed by law.

## The Fire Service in Middletown Township

The fire services in Middletown Township have a proud history of serving the community that dates to the early 1800s. The Langhorne-Middletown Fire Company organized in 1829 followed by the William Penn Fire Company in 1832, the Penndel Company in 1911, and the Parkland Volunteer Fire Company in 1922. All four fire companies are comprised entirely of volunteer members.



In the late 1950's, the fire services in Middletown Township organized themselves into the "The Skyline Fire District." The purpose of this district was to coordinate the delivery of fire services within Middletown Township. Until 2012, the apparatus of the fire departments was a combination of Township owned vehicles and Volunteer Fire Company owned vehicles.

In the spring of 1972, the Skyline Fire District contracted with the National Fire Protection Association for professional advice and consultation concerning fire protection needs in Middletown Township.

The 1972 Study made the following recommendations:

1. One responsible organization should be organized to provide all fire protection services.
2. The Township government must eventually assume the responsibilities to provide fire protection services.
3. A full-time paid fire chief should be employed.
4. Some existing fire stations should be relocated.
5. An active fire prevention program must be instituted.
6. At least a part time fire department will be necessary in the near future, and should be phased-in over a period of years.
7. Firefighting methods should be improved and modernized.
8. Water supply systems must be provided, and some existing systems upgraded.
9. Complete and comprehensive training programs must be instituted.
10. Apparatus and equipment provisions and maintenance should be improved.
11. Greater aerial ladder and master stream capabilities are needed.

Dynamix Consulting Group notes that in 2021, almost a half a century following the 1972 report, most of the issues identified by NFPA are still issues that need to be addressed. These issues will continue to degrade until Middletown Township commits the necessary resources to address these problems.

The Skyline Fire District was dissolved in 2012. With the dissolution of this model, the Township transferred all fire apparatus to the fire companies. The responsibility for purchasing fire apparatus was transferred to the volunteer fire companies as well.

With the dissolution of the Skyline Fire District, the four volunteer fire companies each entered into separate contracts in 2012 to provide fire services within Middletown Township.

Dynamix Consulting Group's review of the contracts revealed that while the contracts have served the Township well, to date, the time has come to update the contracts to meet



industry standards, best practices, and the changing needs of both the volunteer fire companies and the community. Dynamix Consulting Group will offer a series of options for future contracts between the volunteer fire companies and the Township in the *Long-Term Opportunities and Short-Term Recommendations* section of this report.

The Township has historically staffed a Fire Marshal's Office that included a Fire Marshal and Fire Code Inspectors. The Township tasked the Fire Marshal's Office with performing fire code inspections, fire prevention education, fire investigations, and emergency management duties.

In August 2018, the Fire Marshal's Office's duties expanded to include emergency response. The Fire Marshal's Office later became the Department of Fire and Emergency Management. During the COVID-19 Pandemic of 2020, the Township's Fire Code Inspectors temporarily relocated from the Department of Fire and Emergency Management located in the Middletown Municipal Center to the Penndel Fire Company for the safety of the employees.

## Dual and Combination Fire Departments

In 2005, the International Association of Fire Chiefs Volunteer and Combination Officers Section issued *The Red Ribbon Report: Lighting the Path of Evolution: Leading the Transition in Volunteer and Combination Fire Departments*. This report detailed the difference between "combination" and "dual" fire departments.

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Characteristics of a Dual Fire Department
Volunteers operating in different quarters than paid staff
Volunteers riding on separate apparatus than paid staff.
Separate rules and regulations are used.
One group receives better equipment and apparatus than the other does.
Rank structures and supervision are not integrated.
No opportunity for social interaction.

It is Dynamix Consulting Group’s opinion that the fire services in Middletown Township exhibits more dual fire department characteristics than combination characteristics. Further, this arrangement is a critical weakness within the fire services in Middletown Township that, if not addressed, will likely result in Middletown Township eventually having to staff a full-time paid fire department without the support of volunteer firefighters.

The loss of the volunteer fire service would be a detriment to Middletown Township for many reasons: the volunteer firefighters have served the community dating back to the early 1800s; they have a tradition of providing an excellent level of service to those who live, work, or pass through the Township; and their contributions have significantly offset the operational costs, thus resulting in a lower tax burden than if the Township were required to staff a full-time paid fire department.

Within the *Organizational Planning* section of this report, Dynamix Consulting Group will highlight the importance of establishing a current mission statement, values statement, and organizational values. As part of this process, the fire services in Middletown Township must determine its current and future identity and to answer these questions:

1. Do the fire services in Middletown Township endeavor to be a volunteer, career, dual, or combination fire department?
2. Is the ultimate goal to be a career fire service supported by volunteer firefighters, or a volunteer fire service supported by career firefighters?
3. Is the Township better served by one unified system of fire service delivery comprised of multiple fire companies or by four fire companies that are completely autonomous and independent of the Township?



As the fire service is a dynamic environment, the answers to these questions will likely change over time, thus requiring the fire services in Middletown Township to regularly evaluate, potentially update, and then reaffirm its mission statement, vision statement, and organizational values. The exercise of evaluating, updating, and reaffirming is necessary to ensure appropriate deployment of limited resources to satisfy the priorities of Middletown Township.

It is imperative that all levels of the organization, from the newest firefighter to the Township's elected officials, understand the mission and priorities of the fire services so that decisions made at all levels consistently possess the same focus and priorities.

Once the fire services in Middletown Township establishes an identity, they must then brand themselves. A brand is a product, service, or concept publicly distinguished from other products, services, or concepts so that it can be easily communicated and marketed. Branding is particularly important if the fire services in Middletown Township continues to be staffed by both paid Fire Code Inspectors as well as volunteer firefighters because this arrangement must be effectively communicated to the public and leveraged to recruit both new volunteer fire fighters as well as paid Fire Code Inspectors.



## 4. FINANCE

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This section provides an overview of the financial health, sustainability, and financial practices of the various emergency providers for Middletown Township including the William Penn Fire Company, Penndel Fire Company, Parkland Fire Company, Langhorne-Middletown Fire Company, and Penndel-Middletown Emergency Squad. Data provided for this analysis includes the financial records from the Township, fire/EMS companies, and relief associations.

### Funding, Fees, Taxation, & Financial Resources

#### Township Finances

A review of the financial documents indicates that the Township is on a strong financial footing. The General Fund balance is strong despite a significant decrease in 2020 due to loss of revenues during the pandemic. Middletown Township earned a triple-A bond rating (Moody's), the Certificate of Achievement in Financial Reporting award and the Distinguished Budget Presentation Award.

The pension funds are appropriately funded with a discount rate of 7%, generally regarded as reasonable. A discount rate is the assumption made by the actuarial valuation to estimate the current costs of future obligations. Police are currently contributing 5.75% of salaries to their defined benefit plan. Other fulltime Township employees contribute 5% to a defined contribution pension plan. A concern of note is the growing Other Post-Employment Benefits (OPEB) liability. As of 12/31/19, the net liability was \$12,579,021. Middletown Township is on the pay-as-you-go method, which only funds the expense as it occurs. Ideally, the Township should treat OPEB like a pension liability, and invest funds to offset the liability. Few municipalities have initiated proactive OPEB funding, so Middletown Township is not the exception to this practice; however, the Township should recognize and monitor the growing liability with future budgets.

#### Fire Protection

The Second Class Township Code provides for funding of fire protection primarily through either the General Fund, the Fire Fund, or a combination of the two. Middletown is funding fire protection by the four fire companies through the Fire Fund, while the General Fund is supporting Township paid staff.

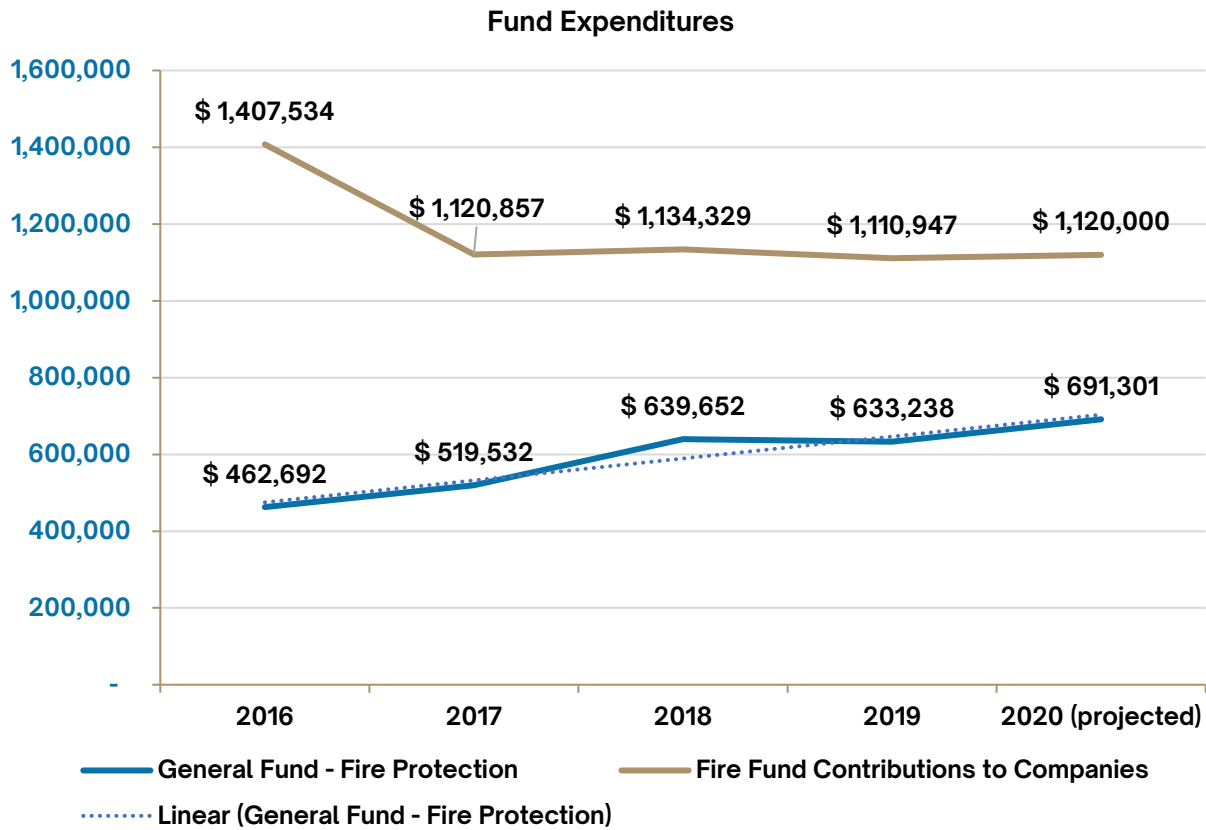
The primary source of revenue for the Fire Fund is real estate taxes. There are caps on the millage rate for each of those funds, 14 mills for general use and three mills for fire



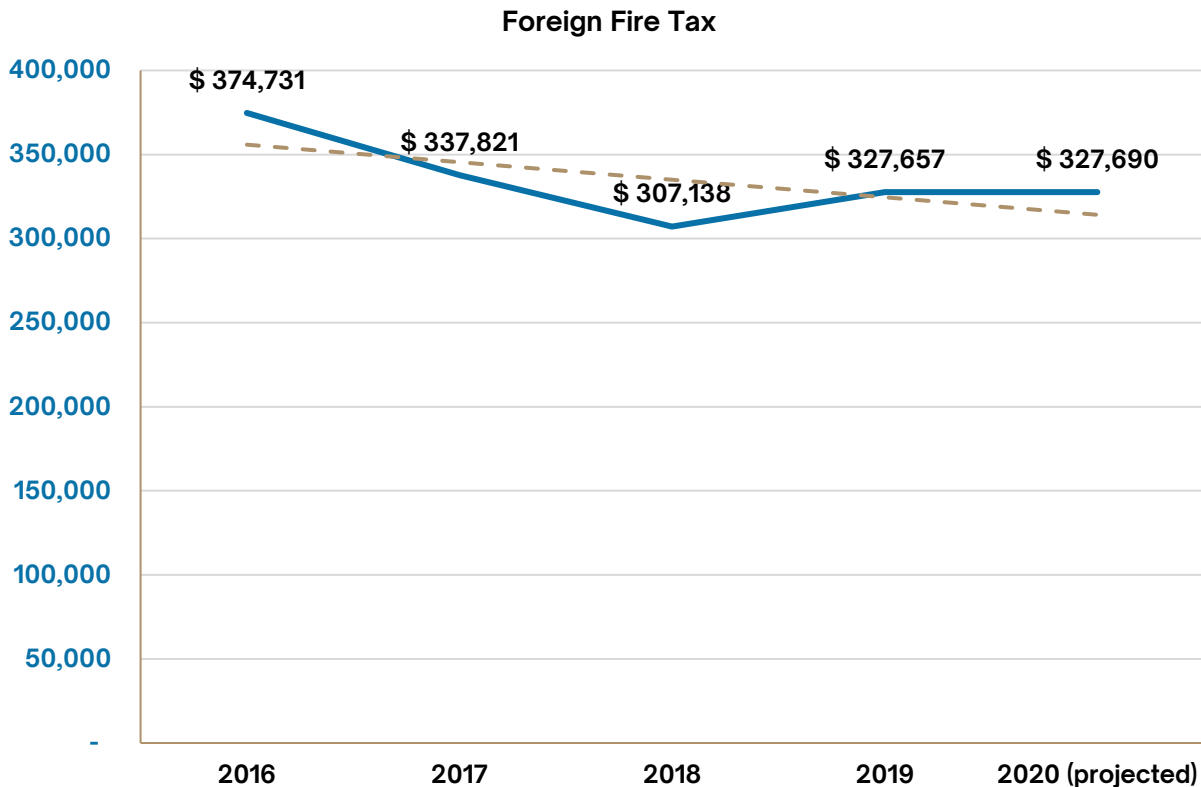
protection. It is also important to note that one of the three mills for the Fire Fund is available for salaries and benefits; however, the Township does not use the Fire Fund for salaries and benefits currently. The General Fund supports all Township departments with the police department representing the greatest cost to the Township. Public safety departments typically represent the largest portion of funding of local government. Another major taxing opportunity available to the Township is the Earned Income Tax, which is the largest source of General Fund revenue. Middletown Township currently has a General Fund mill rate of 7.325 and a Fire Fund mill rate of 1.545. The Township possesses a significant ability to raise revenue in the General Fund, as it is approximately half of the statutory mill rate cap. However, the Fire Fund rate can only be increased approximately 1.5 mills. This is not an immediate concern but may become so if the need for increased funding arises. A contributing issue is the low level of assessments in Bucks County, which depresses the value of a mill. The county common level ratio is below 10% and is the lowest in the state. The Bucks County Board of Assessment's failure to reassess properties resulted in real estate taxes being flat year over year. The Township's annual budget document explains the reassessment in detail.

The graph below shows the trajectory of expenditures made by the Township. There was a one-time intergovernmental revenue of \$300k in 2016. The General Fund expenditures for fire protection continue to escalate due to increased personnel costs while the contribution to the fire companies remains flat.





A subset of the contributions to the fire companies is from the Pennsylvania Foreign Fire Insurance Tax. This tax passes through the Township’s Fire Fund to the volunteer companies in a proportional amount to real estate tax revenue. The Commonwealth of Pennsylvania levies this tax on certain insurers and passes proceeds to municipalities. The municipality then passes the funds to the fire companies’ relief fund. Limitations on how fire companies may spend these funds is statutory. This funding source fluctuates year to year based on taxes collected. Due to recent changes in the method of collecting and dispersing the taxes, many relief associations are seeing decreased amounts of aid over the last several years. This trend will likely continue and therefore the fire companies should develop plans for continued shortfalls.



The overall impact of the various funding sources is that for 2020, Middletown Township and the community contributed \$2,138,991 in expenditures for fire protection.

Dynamix Consulting Group the Commonwealth of Pennsylvania requires fire companies to be insured with workers compensation in their home municipality. Parkland Fire Company is the only fire company located within Middletown Township. Langhorne-Middletown Fire Company, Pennel Fire Company, and William Penn Fire Company are located in boroughs.

## Operating Budgets

The budget in the Township General Fund dedicated to fire protection is almost exclusively for the fire marshal and inspectors. As shown above, there has been a gradual increase in personnel costs as the full time employee count has increased 23% in recent years. This represents a change from eight employees in 2016 (three full time and five part time) to 18 employees in 2021 (six full time and 12 per diem). The budget in the Fire Fund likewise is exclusive, but for the benefit of the fire companies.

The individual budgets of the fire companies contain the commonly found line items. Each budget is constructed differently and with varying degrees of sophistication. Comparing



actual expenditures to correlating budget line items are not part of the review process, and therefore assumptions as to proper accounting are left undetermined.

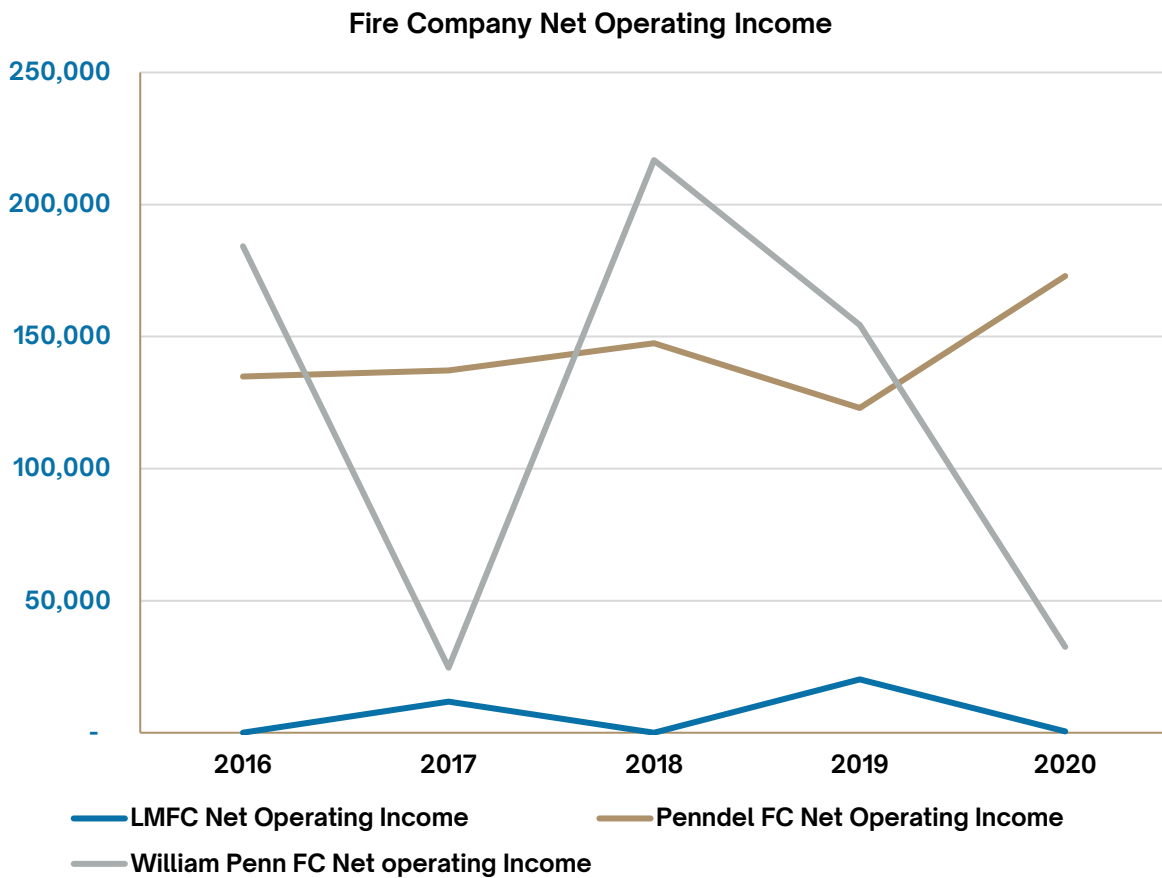
Article 1803 of the Second Class Township Code requires fire companies to submit an annual report to the Board of Supervisors on the use of appropriated funds before making any further payments to the company. The Township should ensure those reports are received and provide for a standard format for submission.

## **Capital Plans and Budget**

Middletown Township, William Penn Fire Company, and Langhorne-Middletown Fire Company provided capital plans. When the Skyline Fire Districted dissolved in 2012, the Township transferred all fire apparatus to the fire companies. The responsibility for purchasing fire apparatus was transferred to the volunteer fire companies as well.

Although the Township plan provides funding for operations and apparatus, the degree to which the individual fire companies maintain this separation is unclear. Since these are major expenses, all companies working in concert with the Township should have a plan for the retirement, funding, and replacement of each apparatus and capital equipment. Furthermore, the Township and fire companies should work together to create a consolidated capital plan. The collective group should plan for collective fleet replacement to meet the needs of the Township. The apparatus of each company should complement each other and avoid unnecessary overlap, duplication, and identify area-wide needs.

Each capital item should have a defined funding source. Without a stabilizing intervention by the Township, future consolidation of organizations is likely. The Township may consider the value in opening discussions regarding the purchase and ownership of the fleet with the companies. The graph below shows that only one of three (Parkland data not provided) fire companies has consistent savings to fund future capital needs, although William Penn Fire Company does an annual contribution to an apparatus fund.



## Fire Services Analysis

The analysis begins with first looking at the entire financial structure of the system, then observing individual entities. The four volunteer fire companies have some similar components regarding their finances.

### Agreements

The foundation for the finances of the volunteer fire companies are the agreements with the Township that govern the obligations of each party. The majority of volunteer fire company funding is tax revenue either generated by, or funneled through, the Township. Review agreements regularly to ensure all parties are fulfilling their obligations and that the agreement is still representative of the current relationship. The current agreements are from 2012 and several areas need review, including:

- Ensuring the required periodic meetings are occurring.
- Examine the practice of allowing tax revenue to purchase apparatus not owned by the Township.



- Mill rate.
- Examine the proportion of tax funds given to each volunteer fire company to determine if the current method of providing 25% to each company indifferent to performance metrics remains the best approach.
- Conduct an annual audit of each fire company, at Township expense (currently not occurring with all fire companies).
- Submit annual budgets to the Township (appears not currently occurring).
- The Township insurance carrier should review indemnification language.

## Audits

As noted above, agreements require volunteer fire company audits, but audits are not currently occurring. Although required by the agreements in place, Commonwealth law does not require audits. However, an audit or financial review is a good practice to ensure funds are properly accounted. This will be a new expense, but the benefit of knowing how fire companies utilize taxpayer funds is important. Middletown Township typically contributes a total of approximately \$1.1 million a year to the fire companies. However, the majority of these funds are not subject to auditing. The Commonwealth audits the pass-through funds of the Foreign Fire tax. However, funds contributed by the Township need auditing as well.

## Volunteer Fire Company Analysis

### Langhorne-Middletown Fire Company

The Langhorne-Middletown Fire Company documents analyzed include budgets, expenses, and income from 2016-20 along with a capital plan.

The operating income and expenses are essentially breakeven throughout the time period reviewed, indicating that the company is managing their expenses within the allotted budget. There is no indication of an attempt to save funds for capital items. Dynamix Consulting Group did note that the Langhorne-Middletown Fire Company operates two stations with the same fund allocation as those fire companies that operate a single station.

Documents provided did not include data on reserves, liabilities, or other typical finances. Audits and financial reviews typically reveal this information, which is helpful in determining the overall financial health of the company.

An audit of the Relief Association noted no deficiencies.



## Parkland Fire Company

The Parkland Fire Company documents analyzed were limited to the 2016-20 budgets. Submittals lacked actual revenues and expenses. The inability to track and report income and expenses is a material deficiency. The Second Class Township Code requires fire companies to supply funding municipalities with this information. Parkland should begin using an accounting system to track budget, expenses, and revenues.

Documents provided did not include data on reserves, liabilities, or other typical finances. Audits and financial reviews typically reveal this information, which is helpful in determining the overall financial health of the company.

An audit of the Relief Association noted no deficiencies.

## Penndel Fire Company

The Penndel Fire Company documents analyzed include a budget summary, expenses, and income from 2016-20. The budget summary was in a Microsoft Word document, which had mathematical errors in 2017, 2020, and 2021. Administrators should manage finances, enter all data, and produce all reports in one system to avoid numbers that do not agree. Penndel did report revenue and expenses through an accounting system.

The operating income significantly exceeds expenses on an annual basis indicating that the company is managing their expenses within the allotted budget while saving for future capital items.

An audit on their Relief Association revealed two areas of concern. There was a finding that the company did not maintain a complete and accurate equipment roster of equipment owned by the Relief Association. There was also an observation that the savings in the bank exceeded the FDIC insurance limits.

## William Penn Fire Company

The William Penn Fire Company documents analyzed include budgets, expenses, and income from 2016-20 along with a capital plan.

The operating income significantly exceeds expenses some years and is essentially breakeven for other years indicating that the company is managing their expenses within the allotted budget but may not have the ability to save consistently for future capital items. Dynamix Consulting Group did note that the William Penn Fire Company operates two stations with the same fund allocation as those fire companies that operate a single station,



Documents provided did not include data on reserves, liabilities, or other typical finances. Audits and financial reviews typically reveal this information, which is helpful in determining the overall financial health of the company.

An audit performed on the Relief Association revealed no deficiencies.

## **Penndel-Middletown Emergency Squad**

Penndel-Middletown Emergency Squad is the primary EMS responder for Middletown Township and is not part of the fire protection service. Middletown Township contributes approximately \$232,000 per year to Penndel-Middletown Emergency Squad via a separate Ambulance and Rescue Fund. This amount may be higher than the contribution other municipalities make to their ambulance service and Middletown Township should research what other providers cost.

Penndel-Middletown provided the 2020 budget and actual expense, 2019 audit, and Relief Association audit. The data shows that Penndel-Middletown Emergency Squad has income exceeding expenses and is generally in good financial condition. However, Penndel-Middletown Emergency Squad is suffering, along with most other emergency medical services providers, with a declining collection rate on their billings. Industry wide staffing issues will also be a factor for them to contend with in the future. Middletown Township should have continued dialogue with Penndel-Middletown Emergency Squad to deal with these evolving issues.

An audit performed on their Relief Association revealed an area to address; there was a finding that the company did not maintain a complete and accurate equipment roster of equipment owned by the Relief Association.



## Financial Summary

The ability to fund proper fire protection services is critical to their success. In this case, there is no indication that lack of funding is occurring or that the ability to increase funding is not possible. Individual companies may have funding issues that need addressing.

The most important observation is the lack of coordination and planning between the entities. Fire companies should properly account for all finances, and openly share information. In addition, all agencies should cooperatively develop budgets and capital plans to meet the current and future operational needs of the community.

The Township should assist the companies as needed to accomplish these goals. No one volunteers for a fire company to be an accountant or a budget analyst. The Township has this expertise and should teach and support the companies regarding these functions.

- Township finance department should assist the companies with establishing appropriate financial reporting and controls.
- A single capital plan should be collaboratively developed and reviewed annually.
- Review agreements for compliance and relevance.
- Complete audits or financial reviews of each company.





## 5. STAFFING

### Volunteer Firefighters

The fire services in Middletown Township have historically been comprised of volunteer firefighters. In August 2018, the Township shifted the primary focus of the Fire Code Inspectors to include emergency response to supplement the weekday response of the volunteer firefighters. The Township staffed this daytime response by having its Fire Code Inspectors respond to calls. Prior to August 2018, the Fire Code Inspectors did respond to major incidents by reporting to the fire stations and then responding with apparatus, but in August 2018, the Township leased an engine from the Penndel Fire Company, with a backup lease with the William Penn Fire Company, which the paid Fire Code Inspectors operated from their work location during the day.

### Volunteer Firefighters in the United States

In February 2020, NFPA published its 2018 U.S. Fire Department Profile report.<sup>7</sup> The report, based on data collected via a national survey of fire departments, estimated 745,000 volunteer firefighters in the United States in 2018.

Volunteer Firefighters in the U.S., 2000–2018

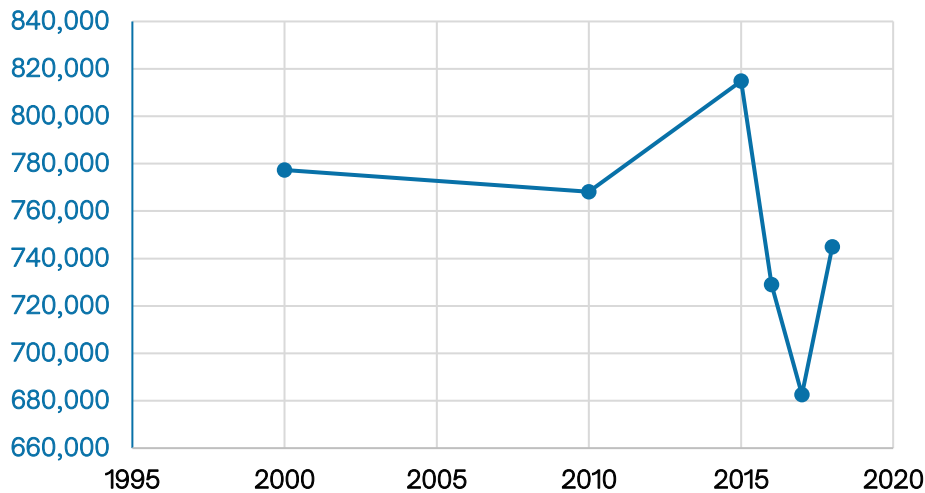
Year	# of Volunteer Firefighters	Annual Change (%)
2000	777,350	—
2010	768,150	-1.18
2015	814,850	6.07
2016	729,000	-10.54
2017	682,600	-6.36
2018	745,000	9.14
2018 Compared to 2000		-4.16

While there are still 745,000 volunteer firefighters in the country—an increase of 9% from 2017—the number of volunteer firefighters has declined by 4.16% since 2000.

<sup>7</sup> <https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Emergency-responders/osfdprofile.pdf>.



Volunteer Firefighters in the U.S. 200-2018



The International Association of Fire Chiefs, Volunteer Combination Officers Section, released the report *A Call for Action: The Blue Ribbon Report; Preserving and Improving the Future of the Volunteer Fire Service* in 2004. The report suggests that recruiting and retaining volunteer firefighters is not limited to Middletown Township or even the Commonwealth of Pennsylvania, but is, in fact, a national concern. According to the Blue Ribbon Report, “While volunteer firefighters and emergency workers provide a tremendous contribution to our country, they are often under-funded and ill-equipped. Lacking cohesive national leadership, efforts to correct these problems are often fragmented and ineffective.”

The IAFC report puts forth recommendations for preserving and improving the future of the volunteer service at the federal, state, and local levels of government.



**IAFC Recommendations for Improving the Volunteer Fire Service**

Level of Government	IAFC Recommendations for Improving the Volunteer Fire Service
Federal	<ul style="list-style-type: none"> <li>▪ Work to produce a national climate, encouraging individuals to volunteer within their local communities.</li> </ul>
State	<ul style="list-style-type: none"> <li>▪ Emphasize the importance of the state government in developing and promoting disaster planning.</li> <li>▪ Certify fire and emergency medical services (EMS) personnel to comply with basic training standards.</li> <li>▪ Promote regional service delivery where local capabilities and technical expertise are weak.</li> <li>▪ Provide statewide volunteer benefit programs to protect both the firefighter and employer from the risks associated with volunteer fire service.</li> </ul>
Local	<ul style="list-style-type: none"> <li>▪ Emphasize the importance of local support for this basic community service.</li> <li>▪ Provide appropriate levels of funding for necessary safety gear and training.</li> <li>▪ Engage in strategic planning that emphasizes volunteer retention.</li> <li>▪ Use mutual aid to offset service and technical deficiencies.</li> <li>▪ Use uniform incident management systems.</li> <li>▪ Use performance measurement to measure and analyze response times, firefighting effectiveness, training, and retention rates of volunteer fire departments.</li> </ul>

Dynamix Consulting Group suggests that the IAFC recommendations for federal, state, and local levels could all benefit Middletown Township and each of its volunteer fire companies. Federal and even state-level governments are not always able to produce immediate results however, so Dynamix Consulting Group further suggests that Middletown Township continue to formalize a combination fire service system so the Township can support the fire service system as the future of fire services and fire companies evolves.

## Volunteer Firefighters in Pennsylvania

The Commonwealth of Pennsylvania released the report “SR6” in November 2018. “SR6” refers to “Senate Resolution 6” which established a 39-member Commission comprised of fire and EMS leaders from throughout the Commonwealth “...to recommend



improvements to the delivery of emergency services in this Commonwealth and develop and promote legislation in furtherance of its recommendations.” SR6 Commission findings included 27 recommendations comprised of 92 concepts that focused on six areas: Emergency Medical Services, Government Support, Innovation, Recruiting and Retention, Regulations and Codes, and Training and Operations.

SR6 revealed that the challenges of maintaining predominately volunteer fire companies are not new to the Commonwealth. In 2004, the Senate Resolution 60 Commission outlined many of the same issues presented in SR6. The 1976 report “Pennsylvania Burning” identified these same issues. SR6 states, “the delay or failure to take appropriate action has continued to extend and expand the challenges facing Pennsylvania emergency services.”

SR6 paints a bleak picture of the future of volunteer fire fighting within the Commonwealth. According to the report, “Fire and EMS are in crisis—right now.” SR6 reports that the number of volunteer firefighters within the Commonwealth has declined from approximately 300,000 in the 1970s to 60,000 in the early 2000s and then to 38,000 in 2018. SR6’s conclusion is that “the significant drop in the number of volunteer emergency services ranks can be directly attributed to the fact that (in addition to fighting fires and responding to every other imaginable emergency around the clock), our volunteer emergency service responders are often the same individuals who must raise funds to pay for their own training, in many cases provide for their own equipment, conduct administrative services and support, and maintain equipment and facilities. Taken together, the many tasks performed by a decreasing number of volunteers only exacerbates the problem and overwhelms those who remain active.”

SR6 includes 92 recommendations that range from providing incentives and additional funding streams to revising legislation in response to this self-proclaimed crisis. The SR6 “Commission recommends that the General Assembly act as expeditiously as possible to enact a series of incentives to stem the decline in emergency service volunteerism, to help retain the dedicated volunteers we still have, and to attract the next generation of recruits in the proud neighbor-helping-neighbor tradition of our volunteer emergency service organizations.”

## **Volunteer Firefighters in Middletown Township**

Data was a limiting factor in Dynamix Consulting Group’s ability to evaluate trends within the fire service in Middletown Township. Six separate databases store collected data related to fire responses in the Township – one for each for three companies, two for another company, and one for the Department of Fire and Emergency Management.

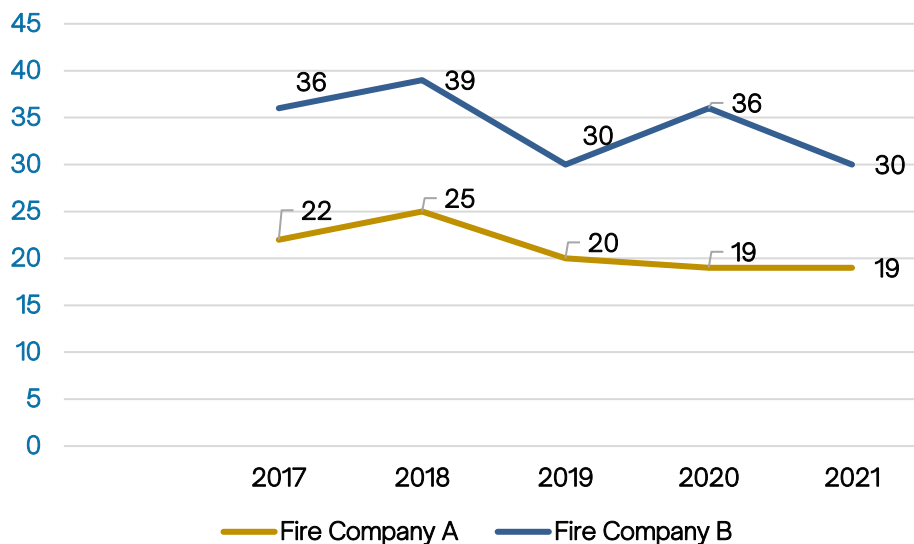


## Fire Chiefs Survey

In an effort to establish current volunteer firefighter conditions within Middletown Township, Dynamix Consulting Group sent out a seven-question electronic survey to the four volunteer fire chiefs in the Township. All four volunteer fire chiefs participated in this survey.

The first question for the fire chiefs asked how many active firefighters they had on their roster during each of the last five years. One chief did not answer this question, one simply answered “not enough”, and two chiefs provided the number of firefighters on their roster during each of the last five years. Half of the fire chiefs in Middletown Township reported declines in the number of active firefighters on their roster during the last five years.

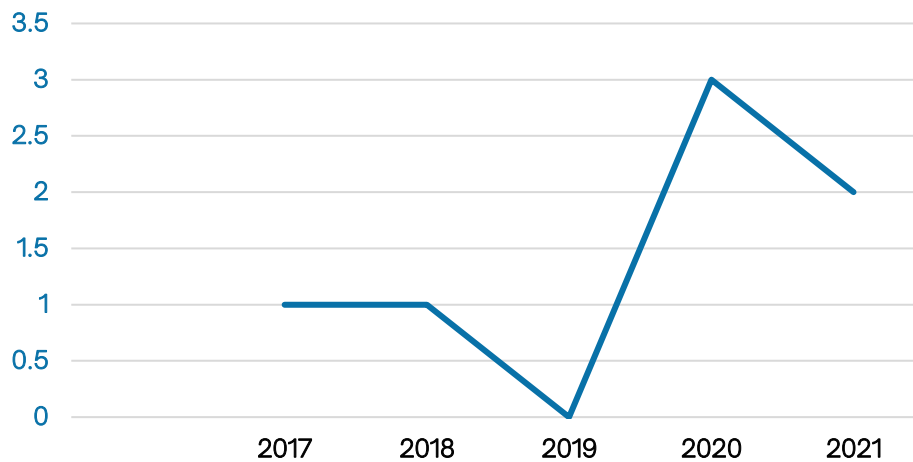
Number of Volunteer Firefighters by Company; 2017-2021



The next question for the fire chiefs asked how many volunteer firefighters their company recruited during the last five years. Again, one chief did not answer this question. A second answered “Few that actually stayed on board and completed required courses to become an interior firefighter” and the third answered that they have recruited between two and five firefighters during each of the last five years. The fourth fire chief provided the actual number of volunteer firefighters recruited by his fire company during each of the last five years.



Number of New Volunteer Firefighters By Fire Company;  
2017-2021



Dynamix Consulting Group then asked the fire chiefs whether their fire company has a sufficient number of personnel who are willing to participate in fundraising activities. All four fire chiefs answered that their company did not have a sufficient number of personnel who were willing to participate in fundraising activities.

As it relates to emergency response, the question of whether fire apparatus responding without enough certified firefighters to perform the operations expected of that unit could jeopardize the safety of citizens and the responders.

Two of the four fire chiefs in Middletown Township reported that fire apparatus responding without enough certified firefighters is happening with less frequency within their fire companies. One fire chief reported that the performance of his fire company has been consistent during the last five years. One fire chief reported that apparatus responding without enough certified firefighters is happening with more frequency.

The fifth question stated when fire apparatus regularly fails to respond in a timely manner, the community is endangered and fire department managers have a reliability problem. Two of the fire chiefs reported that this is happening with more frequency in their fire companies. One fire chief reported that the performance of his company has been consistent during the last five years, and one fire chief reported that this is happening with less frequency within his fire department.

The sixth question asked the fire chiefs to comment on asked when an emergency call goes unanswered, the fire department has a serious problem. This is not just because life



and property are at stake, but also because it is a failure that is highly visible to the public. Two of the fire chiefs reported that this is happening with more frequency in the fire company. One chief reported consistent performance during the last five years, and one chief reported that this is happening with less frequency in his fire company.

Finally, Dynamix Consulting Group gave each fire chief an opportunity to provide any additional feedback that they wished to share. One chief offered the following:

*...The data would say things are ok, but the reality is numbers, especially averages can skew that very data. In my mind the picture is clear that the availability of the volunteer fire service is diminished, especially during the day (0600-1800).*

A second chief offered this input:

*... We should be more worried about the declining members in the stations and not on purchasing toys. Money should be geared towards helping the companies retain the members they have and staffing the stations...*

## Indicators for Change

In an effort to further evaluate the staffing of the volunteer fire services in Middletown Township, Dynamix Consulting Group applied five of the “Indicators for Change” that were identified by the Volunteer and Combination Officers Section of the International Association of Fire Chiefs in its 2005 *Red Ribbon Report: Leading the Transition in Volunteer and Combination Fire Departments*.

While there is no established rule about when a community should consider hiring additional paid firefighters, these Indicators do provide guidance for when a community should consider an increase in paid staffing.



Indicators for Change

IAFC Indicators for Change	Description	Middletown Township
1. <b>Community Growth</b>	A history of community growth and projected increases in demand can help forecast and plan for changes in the delivery of emergency services.	Middletown Township reports a 2.5% growth rate since 2000. <sup>8</sup> While this is a modest growth rate, Township wide, there has been 38.6% increase in the demand for fire and rescue services between 2017 and 2019. There were 3,885 calls for service in the Township in 2017; in 2019, there were 5,386 calls. Demand slightly decreased in 2020, but that is likely an anomaly resulting from the COVID-19 Pandemic.
2. <b>Community Aging</b>	A fire department’s ability to recruit new members is in part dependent on the supply of new, younger people available for service. A community’s age profile can be an indicator of potential volunteer firefighter recruitment problems ahead.	Volunteer firefighters tend to be within the age range of 18-64 years old.  A comparison of the 2000 and 2010 Census showed that Middletown Township population within this age range actually increased by 2.55%.
3. <b>Reduced Staffing</b>	Units responding with fewer than the required number of people needed to perform that unit’s functions pose a serious problem for the safety of citizens and the responders.	Two of the four fire chiefs reported that units were responding more frequently during the last five years without enough certified firefighters.

<sup>8</sup><https://www.middletownbucks.org/Resources/Documents-Forms/Administration/Comprehensive-Plan-2020-%E2%80%93Final>





IAFC Indicators for Change	Description	Middletown Township
<b>4. Extended Response Times</b>	When units regularly fail to get out of the fire station in a timely manner because of inadequate staffing resources, the community is endangered and fire department managers have a reliability problem.	Fire Chiefs from half of the Township’s volunteer fire companies reported that units were failing to respond in a timely manner more frequently during the last five years without enough certified firefighters.
<b>5. Missed Calls</b>	When an emergency call goes unanswered, the fire department has a serious problem, not just because life and property are at stake, but also because it is a failure highly visible to the public.	Fire Chiefs from half of the Township’s volunteer fire companies reported that units were failing to answer calls more frequently during the last five years without enough certified firefighters.

Four out of the five IAFC Indicators for Change indicate that Middletown Township should begin considering making changes to the current staffing of its fire services. The only indicator that did not directly apply to Middletown Township was Community Aging. While the segment of the population that is most likely to volunteer as a firefighter (ages 18-64) increased 2.55%, the increase in this age range is not translating to an increase in volunteer firefighters.

As the fire services in Middletown Township evolve, changes will have to occur. Effectively managing these changes will require a new level of commitment, planning, and consideration.



## Department of Fire & Emergency Management

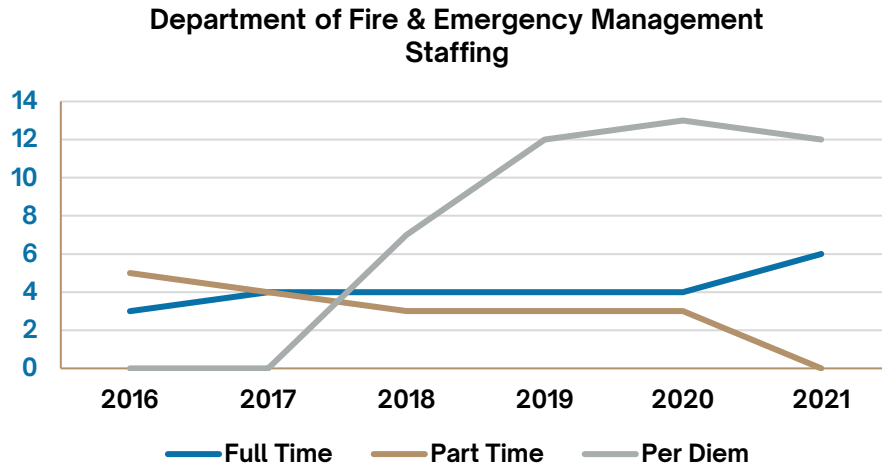
The Department of Fire and Emergency Management staffs as follows:

Department of Fire and Emergency Management Position	Number of Full Time Employees
Fire Marshal	1
Fire Code Inspector	4.5*
Administrative Assistant	0.5*
Per Diem Staff	12

*\* The .5 positions combine to be one Full Time Employee.*

Full time employees work 40 hours a week; part time employees work less than full time on a regular schedule, and per diem employees work as needed to fill out the schedule. Per diem employees do not have regular or guaranteed hours. Many of the per diem employees also serve as volunteer firefighters in fire companies in or near Middletown Township. They may also serve as full-time inspectors or firefighters in other municipalities.

Since 2016, there has been a dynamic shift in the staffing model of the Department of Fire and Emergency Management; part-time employees phased out while there was a 125% increase in the number of per diem employees and a 100% increase in full time employees. This represents a change from eight employees in 2016 (three full time and five part time) to 18 employees in 2021 (six full time and 12 per diem).



	2016	2017	2018	2019	2020	2021	Change
Full-Time	3	4	4	4	4	6	3
Part-Time	5	4	3	3	3	0	-5
Per Diem	0	0	7	12	13	12	12
<b>Total Employees</b>	<b>8</b>	<b>8</b>	<b>14</b>	<b>19</b>	<b>20</b>	<b>18</b>	<b>10</b>

## Code Enforcement

Middletown Township has adopted the 2015 International Fire Code, as specified by the Uniform Construction Code, including all appendices, as the International Fire Prevention Code of Middletown Township to prescribe the minimum standards, requirements, and controls to safeguard life, property, and public welfare from hazardous conditions, especially fire and explosions. Middletown Township adopted §190-102 of the Code sets forth the additions, insertions, and changes to the 2015 International Fire Code. Changes adopted that relate to the provision of fire and emergency response within the Township are as follows:

- Change Section 103.1, General. Delete the entire section and insert in its place the following language:

**103.1 General.** The Department of Fire and Emergency Management is established within the jurisdiction under the direction of the Municipal Fire Official. The function of the department shall be fire suppression and emergency management, and implementation, administration, and enforcement of the provisions of this code. The department director will be herein referred to as the "Municipal Fire Official."



- Change Section 104.1, General authority and responsibilities, general. Delete entire text and insert in its place the following language:

**104.1 General authority and responsibilities.** It shall be the duty and responsibility of the Office of Fire and Emergency Management or the duly authorized representatives to enforce the International Fire Code herein set forth. The designated enforcement officer of this code is herein referred to as the "Municipal Fire Official."

- Change Section 104.11, Authority at fires and other emergencies. Delete the entire section and insert in its place the following language:

**104.11 Authority at fires and other emergencies.** The Fire Marshal, fire chief or officer of the department at the scene of a fire or other emergency involving the protection of life or property, or any part thereof, shall have the authority to direct such operation as necessary to extinguish or control any fire, perform any rescue operation, investigate the existence of suspected or reported fires, gas leaks or other hazardous conditions or situations, or take any other action necessary in the reasonable performance of duty. In the exercise of such power, the Fire Marshal and Emergency Manager fire chief or designee is authorized to prohibit any person, vehicle, vessel or thing from approaching the scene, and is authorized to remove, or cause to be removed or kept away from the scene, any vehicle, vessel or thing that could impede or interfere with the operations of the fire department and, in the judgment of the Fire Marshal and Emergency Manager fire chief, or designee, any person not actually and usefully employed in the extinguishing of such fire or in the preservation of property in the vicinity thereof.

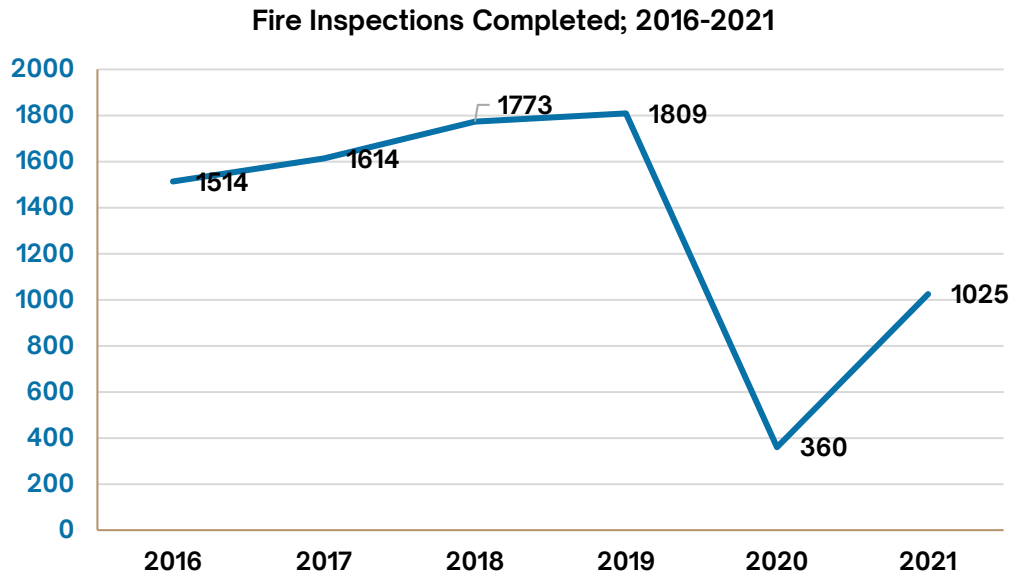
## Inspections

Middletown Township's Fire Code Inspectors perform annual fire/life safety inspections of all publicly occupied commercial, mercantile, and multifamily structures. The purpose of these inspections is to reduce fire hazards and ensure the maintenance of fire suppression, detection, and early warning devices according to current codes and ordinances. Updates to emergency contact information, building and business ownership records, and information regarding any potential dangers to first responders occurs at the time of inspections as well.

There are presently 1,867 businesses files listed within Firehouse Software, which is Middletown Township's fire inspection database. At the time of this study, the Township was in the process of moving to a new system called Emergency Reporting. The Middletown Township Department of Fire and Emergency Management inspected between 1,514 and 1,809 occupancies each year between 2016 and 2019. Inspections during 2020 were significantly



reduced because of the COVID-19 Pandemic. The Township instituted the inspection hiatus to limit exposure of employees and businesses, and to reduce the financial liability on owners of paying for an inspection. The 2020 figure reflects pre-March inspections and those requested by businesses post-March.



## Fire Investigations

The Middletown Township Department of Fire and Emergency Management is responsible for investigating all fires of value loss, hazardous materials incidents, explosions, bomb threats and bomb incidents explosions, or other hazardous conditions within the boundaries of Middletown Township. During 2019, the office completed 119 Fire Investigations. The number of investigations has decreased every year since 2016 when inspectors completed 917 investigations. This was the only year for which the Township provided data.

## Fire & Life Safety Education

All four volunteer fire companies as well as by the Department of Fire and Emergency Management provide fire safety education within Middletown Township. These efforts include in-person presentations as well as the distribution of fire prevention materials. Fire and life safety topics include calling 911, Exit Drills in the Home (EDITH), Smoke Alarms, Carbon Monoxide Alarms, Chimney Safety, Injury Prevention and Fire Extinguisher training.



## 6. TRAINING

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### Office of the State Fire Commissioner

The Office of the State Fire Commissioner (OSFC) is responsible for the implementation of firefighter training and certification developed in accordance with and consistent with established standards within the Commonwealth of Pennsylvania. The Office of the State Fire Commissioner is the certifying agency.<sup>9</sup>

OSFC's Local Level Fire Training Programs occur through the State Fire Academy's system of educational training agencies, which includes participating community colleges, county/regional fire training academies, and other similar organizations. The academy issues Minimum Standards for Accreditation for each accredited course, which defines content and procedural issues for the course. The educational training agencies must adhere to these minimum standards of accreditation for each course in order to issue State Fire Academy "Certificates of Training" for the course. The Local Level Fire Training curriculum currently includes the Entry Level Firefighter curriculum consisting of four courses, plus 130+ separate courses ranging in length from two to 60 hours.

### Insurance Services Office

The Insurance Services Office (ISO) is a New Jersey-based advisory organization that provides insurance carriers with a classification rating of a local community's fire protection. The following is a summary of the items that ISO considers when reviewing a community's firefighter training program.

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<sup>9</sup> [Professional Certification Program \(pa.gov\)](http://pa.gov).



ISO Firefighter Training Requirements<sup>10</sup>

Training Component	Description
Training Facilities	Drill tower Live fire training structure (including smoke room) 2-acre training area
Use of Facilities	18 hours per year per firefighter (for maximum credit)
Company Training	Company training at fire stations, 16 hours per member per month (for maximum credit)
Classes for Officers	Certification of all officers 12 hours per year of continuing education for all officers (for maximum credit)
New Driver and Operator Training	Classes for new drivers and operators, 60 hours (for maximum credit)
Existing Driver and Operator Training	Classes for existing drivers and operators, 12 hours per year (for maximum credit)
Training on Hazardous Materials	6-hour session per member per year (for maximum credit)
Recruit Training	240 hours per recruit in the first year (for maximum credit)

Even though the Insurance Services Office (ISO) requires specific detailed required training for fire personnel, training programs must go beyond simply fulfilling mandatory hours. Training administrators and instructors must ensure that firefighters and officers are not only competent but also self-confident in the variety of skills necessary to perform effectively in high-stress situations.

## Training in Middletown Township

Dynamix Consulting Group’s review of training available to the volunteer fire fighters and inspectors in Middletown Township revealed five independent and different training programs – one for each of the volunteer fire companies and one for the Fire Code Inspectors. This is yet another example of the dual fire service that is operating within Middletown Township. The volunteer fire companies have established training programs with specific weekly, monthly, and quarterly annual requirements. These programs require 24 or more hours of annual training for firefighters with additional requirements for fire officers. The Township Department of Fire and Emergency Management Program sets forth a minimum training requirement of 147 hours for individuals who are Emergency Medical

<sup>10</sup> <https://www.isomitigation.com/ppc/technical/training/>



Technicians and 157 hours for those who are paramedics. Dynamix Consulting Group was impressed with the level of commitment and detail to the training programs that were in place in each of the fire companies as well as the Department of Fire and Emergency Management. However, the lack of overall coordination to ensure that all firefighters system-wide meet minimum training criteria is a weakness of the fire services in Middletown Township.

Dynamix Consulting Group recommends the development of a formal Township-wide Training Program that consolidates all training requirements in one place, including minimum requirements established by the volunteer fire companies and the Township, OSFC Requirements, and ISO Requirements. This program should provide training requirements for both paid and volunteer firefighters. Dynamix Consulting Group suggests that the inclusion of an online learning platform, such as Target Solutions, would allow for more efficiency and flexibility in training both paid employees and volunteer firefighters and provide a better tracking mechanism to document training.

To encourage volunteer firefighting in Middletown Township, Dynamix Consulting Group also suggests that there be established volunteer firefighter roles inclusive of minimum initial training requirements and ongoing training requirements based on the duties that each position is authorized to perform. While it is reasonable to require paid firefighters to perform fire suppression activities within Immediately Dangerous to Life and Health (IDLH) environments and to attend the training that is required to perform those duties, some volunteer firefighters do not have the desire to enter IDLH environments or to perform fire suppression activities. These volunteers may desire, however, to have more on-scene responsibilities than are presently permitted for Fire Police or Administrative Volunteers.

Industry standard is that firefighter training should be commensurate with duties. As such, the more specific a job function is, the simpler it is to establish specific training requirements and ongoing training requirements for that position. As the fire services in Middletown Township have seen a decline in the number of volunteer firefighters in recent years, it would be beneficial to create specific job functions with initial and ongoing training requirements more easily satisfied by volunteers.

Dynamix Consulting Group further suggests that there be checks and balances built into the training program to allow both the Township and the volunteer fire companies to ensure that both volunteer firefighters and paid inspectors meet the established training requirements.





## Participating Department Recognition Program

The OSFC Volunteer Fire Service Certification Program currently offers 34 levels of certification designed to identify and recognize emergency service personnel whose accomplishments in training and education meet or exceed the nationally recognized standards. OSFC recognizes the NFPA standards for Fire Service Professional Qualifications identify the minimum requirements for a person at a particular level of progression.

The Participating Department Recognition Program recognizes fire service certifications at various levels in accordance with nationally recognized and sanctioned Professional Qualification standards. The purpose is to recognize those organizations that support, promote, and encourage emergency response personnel to certify voluntarily within the Commonwealth’s Certification Program administered by the Office of the State Fire Commissioner.

OSFC reports that there are nine fire departments, including the Middletown Township Department of Fire and Emergency Management, within Bucks County that are recognized as Participating Departments as of March 12, 2021.<sup>11</sup> Those fire departments are listed in the following figure.

**Participating Department Recognition Program: Bucks County**

Fire Department	Level	Expiration Date
Bensalem Fire Rescue	100%	1/7/2023
Bristol Township Fire Marshal’s Office	100%	1/29/2022
Edgely Fire Company #1, Inc.	75%	6/18/2023
Hartsville Fire Company	75%	3/27/2021
Middletown Township Department of Fire and Emergency Management	75%	11/29/2021
Newtown Emergency Services Department	100%	2/14/2022
Newtown Fire Association	75%	4/18/2022
Sellersville Fire Department	75%	1/13/2023
Yardley-Makefield Fire Company	75%	11/7/2023

The Commonwealth of Pennsylvania recognizes 230 fire departments in the Participating Department Recognition Program.

<sup>11</sup> Office of the State Fire Commissioner, [Participating Departments](#).



Participating Department Recognition Program: Pennsylvania

Level	Number of Departments
100%	45
75%	66
50%	74
10%	45
<b>Total</b>	<b>230</b>

Dynamix Consulting Group suggests that Middletown Township should facilitate a township-wide effort for all volunteer fire companies within the township to be recognized as a Participating Department and then to incrementally increase its level with the ultimate goal reaching 100%.



## 7. PERSONNEL MANAGEMENT

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Effective fire department management is a common challenge for fire service leaders. Today's fire departments must address management complexities that include an effective organizational structure, adequacy of response, maintenance of competencies, a qualified workforce, and financial sustainability for the future. In the following report section, Dynamix Consulting Group examined Middletown Township's current efforts to manage the fire services in the Township and identified measures and best practices for the future.

### Organizational Planning

The development of baseline planning components in an organization enables it to move forward in an organized and effective manner. In the absence of foundational management elements, the organization will tend to operate in a random and generally ineffective manner.

NFPA 1201: *Standard for Providing Fire and Emergency Services to the Public*, addresses the need to have an adopted master plan, an established organizational structure, established mutual aid systems, and a variety of other managerial attributes in place to serve the community effectively. Of specific focus are mission, vision, and values statements, utilized as the department moves forward.

### Mission, Vision, and Organizational Values

Dynamix Consulting Group notes that while there exist mission statements, vision statements and organizational values among the volunteer fire companies and Department of Fire and Emergency Management, that there is no common mission, vision, or values for the fire services in Middletown Township.

#### Mission

A mission statement is an explanation of the organization's reason for existence. The mission statement supports the vision and communicates purpose and direction to personnel, customers, and other stakeholders. The mission statement should answer the questions "What is our organization's purpose?" and "Why does our organization exist?"

Provided below is a sample mission statement.



### Sample Mission Statement

*The mission of the Southington Fire Department is to provide to the residents of Southington and those who pass through it fire and rescue services. To protect life and property through prevention, code enforcement, fire suppression, rescue, and emergency medical services."*

## Vision

A vision statement establishes the ideal image that the organization wishes to achieve. The vision statement should answer the questions "Where are we headed?" and "If we achieved all strategic goals, what would we look like 10 years from now?" Provided below is a sample Vision Statement.

### Sample Vision Statement

*To be the premier emergency services provider in our region that is constantly striving for excellence in service delivery through education, innovation, teamwork, and collaboration.*

## Organizational Values

An organizational values statement includes the core principles that guide the organization and its culture. In a values-led organization, the values guide decision-making and establish a standard to assess actions. The values statement should answer the questions "What values should guide the operations of our organization?" and "What conduct should our personnel uphold?" The Organizational Values Statements should clearly identify the values that guide the operations of the fire services in Middletown Township, upheld by all members. Provided below are Sample Organizational Values.

### Sample Organizational Values

Our core values are driven by:

<i>Accountability</i>	<i>Personal, to each other and our community</i>
<i>Compassion</i>	<i>We demonstrate kindness and empathy</i>
<i>Dedication</i>	<i>We are committed to our organization and community</i>
<i>Ethics</i>	<i>We will consistently strive to do the right thing</i>
<i>Honesty</i>	<i>Truth and fairness in endeavors large and small</i>
<i>Integrity</i>	<i>We adhere to sound moral principals</i>



Ideally, the fire services in Middletown Township will, following the completion of this *Fire Services Study*, work to establish clear mission and vision statements as well as relevant organizational values during the Strategic Planning process. Just as the operations of the fire service are dynamic, so are the guiding principles for the organization. These components can change as the department and community change.

Julie Chakraverty recently wrote an article for Forbes.com titled *Company Vision and Values: Do They Still Matter?*<sup>12</sup> In this article, she cited a recent report from the World Economic Forum that found that a “sense of purpose” in work is the second most important criteria for millennials considering a job, after salary. Ms. Chakraverty concluded that given that this generation will make up the majority of the workforce in coming years, it is not difficult to predict that if candidates for employment do not believe or support an organization’s mission, they will not accept a job offer. This can lead to recruitment challenges. Ms. Chakraverty’s research further suggested that personnel aged between 45 and 54-years-old and 55 to 64-years-old—not uncommon age groups for management—were the least likely age groups to be able to recite their organization’s mission and vision.

## Critical Priorities

Understanding and identifying the critical issues facing any organization is the first step in moving toward resolution. Two of the volunteer fire companies and the Department of Fire and Emergency Management submitted in writing the following critical priorities. These priorities were entirely consistent with those expressed in all of the meetings that Dynamix Consulting Group conducted with leaders from Middletown Township and all four of the volunteer fire companies.

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<sup>12</sup> <https://www.forbes.com/sites/voicesfromeurope/2018/03/28/company-vision-and-values-do-they-still-matter/#7755b77b217f>.



<b>Critical Priorities</b>	
<b>Volunteer Fire Company A</b>	
1.	Local Government Relations
2.	Staffing
3.	Burnout, morale, and frustration
4.	Loss of key personnel
5.	Being expected to do more with less
<b>Volunteer Fire Company B</b>	
1.	Staffing
2.	Funding – Operations and Apparatus
3.	Creating a Township Wide Combination Department
4.	Advancing the Day Time Crew – Staffing and New Engine
5.	Politics and Kingdoms – Lost Vision as related to Mission and the Way Forward.
<b>Township Department of Fire and Emergency Management</b>	
1.	Consistent Reliable Response
2.	Staffing
3.	Funding and Capital Purchases
4.	Teamwork
5.	Training

Now more than any other time in the history of the United States, fire and emergency services agencies operate in a rapidly changing environment. Along with improved tools and technologies used to provide service, there is the increased regulation of activities, new risks to protect, and other challenges that can quickly catch the unwary off guard. Only through continuous internal and external environmental awareness and periodic course corrections can an organization stay on the leading edge.

For the fire services in Middletown Township to do the best job possible with available resources, the focus must be on improving services while identifying programs or activities that may no longer serve its changing needs. Through planning, a fire department can establish a vision, create a framework for decision-making, and chart its course to the future. The quality and accuracy of the planning function determine the success of the organization.

To be truly effective, an emergency services agency must consider planning on four distinct levels:



Planning Level	Description
1. Tactical Planning	The development of strategies for potential emergency incidents.
2. Operational Planning	The organization of day-to-day activities, as primarily outlined by a department's standard operating guidelines and procedures. This includes the integration of the agency into other local, regional, or national response network.
3. Master Planning	Preparation for the long-term effectiveness of the agency as the operating environment changes over time.
4. Strategic Planning	The process of <i>identifying</i> an organization's mission, vision, and values <i>and prioritizing goals and objectives</i> for things to accomplish in the near future.

Without effective planning, it is impossible for any organization to know when it is reaching milestones or providing exceptional services to its constituency. The National Fire Protection Association has established NFPA 1600: *Standard on Disaster/Emergency Management and Business Continuity/Continuity of Operations Programs* and NFPA 1201: *Standard for Providing Fire and Emergency Services to the Public*, as standards to assist fire and EMS departments in establishing and maintaining planning documents and conducting planning activities.

## Tactical Planning

Beyond the fire station, the firefighter's emergency operational work environment is, more often than not, an unknown environment. Normally, a firefighter's first visit to a building is when the building is involved in a fire or another emergency. In the case of a fire, the internal environment is at its worst. Contrary to movie portrayals, visibility during a fire is at or near zero due to smoke. When firefighters are unfamiliar with building layouts, or equipment, hazards, and processes that are unfamiliar, they experience risk of becoming disoriented, lost, or suffering injury.

It is critically important that firefighters and command staff have comprehensive, accurate information readily at hand to identify hazards, direct tactical operations, and use built-in fire-resistive features. Building familiarization tours, developing pre-fire or pre-incident plans, and conducting tactical exercises, either on-site or by tabletop simulation is the only way to accomplish this familiarity.



Dynamix's Consulting Group's interviews with the four volunteer fire companies revealed that the current approach to Tactical Planning within the Township is inadequate. While the Fire Code Inspectors are conducting inspections and drafting tactical plans, all fire companies do not benefit consistently or equally from timely sharing of this information. This creates a dangerous situation where firefighters could be entering occupancies without critical information that could directly impact the work they are about to perform, even though the Township may have the very information the volunteers need to operate safely on file. Current efforts of tactical planning in Middletown Township create a dual fire department characteristic, but efforts to improve could transition to combination fire department.

Pre-incident planning within Middletown Township should include both volunteer firefighters and paid Fire Code Inspectors. Dynamix Consulting Group recommends that Middletown Township purchase a software program specifically designed to make the information collected during pre-plans immediately accessible to all firefighters in an emergency. Many such programs are on the market including Streetwise, Blazemark, and Raxar among others.

## Operational Planning

Operational planning includes the establishment of minimum staffing policies, standardized response plans or protocols, regional incident command planning, mutual and automatic aid planning (locally and regionally), resource identification and planning, and disaster planning.

Within any agency, operational plans should be in place that ensure adequate and appropriate types of resources deploy to an emergency. Doing so involves:

- Identification of potential risk types;
- Determination of resources needed to mitigate an incident affecting the particular risk type; and
- A methodology of ensuring dispatching of adequate resources to an incident via the Public Safety Communications Center protocols.

The development and implementation of rules, regulations, and policies within the volunteer fire companies as well as the Department of Fire and Emergency Management have historically enabled the various entities within Middletown Township to move forward in a separate yet independently effective manner. In the absence of these documents, an organization will tend to operate in a random and generally ineffective manner.

Dynamix Consulting Group reviewed the various policies, plans and protocols that currently exist within Middletown Township fire services. Between the four volunteer fire companies





and the Township Department of Fire and Emergency Management, there are many well thought-out and proactive written documents in place within the Township. One of the effects of operating as a dual fire department is the inconsistency found in a number of documents between the volunteer fire companies and the Department of Fire and Emergency Management.

Dynamix Consulting Group further noted various documents that are outdated or not in compliance with industry standards or best practices. Examples include response protocols that do not assign the closest available unit to emergencies; automatic responses of the Township's career staff to incidents outside the Township's jurisdiction; and emergency response (lights and siren) to medical incidents triaged through Emergency Medical Dispatch (EMD) System as non-emergency in nature.

Dynamix Consulting Group recommends a comprehensive review of all policies, plans, and protocols currently in place within the fire services in Middletown Township. This review should have a focus of consolidating all existing documents into one set of operating procedures; it should also include an annual gap analysis to identify the need for new rules and regulations to comply with industry standards and best practices.

## Master Planning

Master or long-range planning is preparation for Middletown Township's future service delivery effectiveness based on projections of the future service delivery environment. This long-range master plan focuses on the big picture perspective, distant future needs of the fire services in Middletown Township and is particularly important in an agency experiencing growth. Members of the fire services and the community members it serves communicate the need for stronger planning processes regularly. Fire service organizations that engage in a long-range master planning process will be able to utilize this valuable information to answer the following three questions:

1. Where is the organization today?
2. Where will the organization need to be in the future?
3. How will this organization get there?

Middletown Township contracted Dynamix Consulting Group to conduct a *Fire Services Study*. This evaluation will give Middletown Township a clear idea of current conditions of the fire services based on an in-depth evaluation. The *Fire Services Study* will also project some of the future fire services needs of Middletown Township, along with providing the strategies to meet them. Dynamix Consulting Group notes that the scope of work for a



master plan is more comprehensive than that of a *Fire Services Study*. The master plan traditionally includes a full community risk assessment of the environment in which the emergency service operates and provides a deeper analysis of the details of an organization than exist within an agency evaluation. The evaluation provided by Dynamix Consulting Group will provide a strong foundation for a master plan should Middletown Township chose to engage in the master planning process either internally or with outside assistance. Master Plans typically include a 10-15-year planning period.

## Strategic Planning

Strategic planning supports the organization's mission and sets and prioritizes short-term internal goals. A strategic plan typically involves a three-to-five-year planning window. Community involvement in the process is critical, as the strategic plan should be customer-oriented while accomplishing the following:

1. Development of a mission statement giving careful attention to the services currently provided and which logically can be provided in the future.
2. Development of a vision statement of the agency moving forward.
3. Establish the values of the members of the agency.
4. Identification of the strengths, weaknesses, opportunities, and challenges of the agency.
5. Determination of the community's service priorities.
6. Understanding the community's expectations of the agency.
7. Establishment of realistic goals and objectives for the future.
8. Identifications of implementation tasks for each objective.
9. Definition of service outcomes in the form of measurable performance objectives and targets.

At the time of this report, there was not a strategic plan in place for the fire services in Middletown Township. Ideally, the leadership of Middletown Township will accept the *Fire Services Study* or some variation of the study. The recommendations, guidance for changes, and new initiatives detailed within the *Fire Services Study* will provide direction for developing a strategic plan. This is the most effective way to prioritize and plan for the implementation of the *Fire Services Study* findings.



The strategic planning process would ideally result in a three-to-five-year work plan, intended to guide the work effort of the entire organization toward a common set of goals and objectives. The process should include representation from every major interest group in the organization. Each firefighter should feel that someone represents their interests in attendance on the planning team.

Dynamix Consulting Group noted an immediate need for Middletown Township and the four volunteer fire companies to improve communications and establish trust. At the time of the site visit, Dynamix Consulting Group found strained relations resulting from past miscommunications. Dynamix Consulting Group suggests that the Township and all the volunteer fire companies would benefit from having a third party facilitate the initial strategic planning process as well as at least the first year of implementation of that plan.

The members of the fire services in Middletown Township need to be involved in achieving some successes to stabilize the culture of the fire services in the Township. The work associated with implementing a strategic plan provides the perfect opportunity for the Township to work with the fire companies to establish the direction for the future by achieving the goals that are set forth in the strategic plan. Implementing the strategic plan would be a therapeutic process that could help move the fire services in Middletown Township in a positive direction in three to five-year increments.

The leadership of the four volunteer fire companies and the Middletown Township Board of Supervisors should formally adopt the strategic plan, upon completion. Middletown Township and all four volunteer fire companies should then cooperatively implement the plan.

## Interagency Cooperation and Coordination

As noted in *The Fire Service in Middletown Township section* of this report, it is Dynamix Consulting Group's opinion that the fire services in Middletown Township exhibits more dual fire department characteristics than it does combination characteristics. As also previously noted in that section of the report, it is the opinion of Dynamix Consulting Group that this arrangement is a critical weakness within the fire services in Middletown Township that, if not addressed, will likely result in Middletown Township eventually having to staff a full-time paid fire department.

Historically, four independent volunteer fire companies and a Township Department of Fire and Emergency Management have served Middletown Township well. As illustrated in the *Service Delivery* and *Staffing* sections of this report, the demand for fire service within the Township has increased and the number of volunteer firefighters has decreased. Section 1553 of the Second Class Township Code, Act 69 of 1933 states that "The Township shall



be responsible for ensuring that fire and emergency medical services are provided within the Township by the means and to the extent determined by the Township, including the appropriate financial and administrative assistance for these services.”

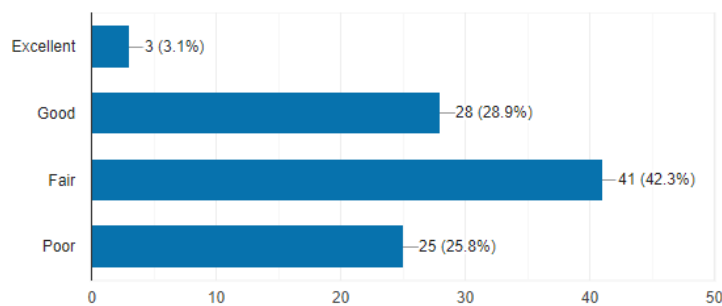
While the volunteer fire companies have provided fire service in Middletown Township dating back to 1829, if they were to disappear tomorrow, the responsibility for providing this service belongs entirely to the Township.

Dynamix Consulting Group solicited input from both the volunteer firefighters and paid Fire Code Inspectors using a 15-question online survey. The survey was open for participation from June 25 through July 15, 2021. In addition to the online survey, Dynamix Consulting Group solicited input from both the volunteer firefighters and paid Fire Code Inspectors through a series of in-person meetings on June 17 18 and 19, 2021.

A total of 97 firefighters from the Fire Services in Middletown Township completed this survey; 82 individuals identified themselves as volunteer firefighters, and 20 individuals identified themselves as paid employees (both full time and per diem).

The feedback from the in-person sessions conducted by Dynamix Consulting Group was entirely consistent with the results of the electronic survey. Those responding to the survey felt that there is a morale problem among the firefighters. A combined 66% of the survey participants felt that moral in the fire services in Middletown Township was fair or poor.

**Morale in Middletown Township Fire Service**



Only 3.1% - three people - felt that morale was excellent, and 28.9% - 28 people – felt that it was good. In general, the survey participants recognize that the dedication of the members of the fire services in Middletown Township to serving the community is by far the biggest strength of the system. Members cited their commitment, diversity, training, and equipment as sources of pride.

There is, however, a widespread feeling between both the volunteer firefighters and paid Fire Code Inspectors that the fire services in Middletown Township requires an immediate



intervention. Years of strained relationships resulting from poor communications have left both the volunteer firefighters and paid Fire Code Inspectors tired. Dynamix Consulting Group heard in each of the four volunteer company meetings, as well as at the paid Fire Code Inspectors meeting, share that they were actively considering quitting the fire services in Middletown Township because they did not want to deal with the fire service drama anymore. Dynamix Consulting Group repeatedly heard from individuals at every meeting that they considered this *Fire Services Study* to be their “last chance” to fix the fire services in Middletown Township before too many more people quit and the volunteer fire companies became unsustainable.

These sentiments were repeatedly echoed throughout the survey as members requested more and improved communication, transparency, coordination, basic respect, and simple appreciation for the services they provide in the Township.

The complete results of the survey are included in Appendix A.

While the volunteer firefighters have stood up to the challenge of increased call volume and a decrease in volunteers in recent years, they will need additional support from the Township in the future to be able to continue to serve the community. This support will most likely be in the form of additional paid firefighters. By working with the leadership of the four volunteer fire companies to create a fire services structure that can expand as needed to support the needs of the fire companies., the Township can help to keep the job of the volunteer firefighters “manageable” thus helping the volunteer firefighters maintain a viable volunteer firefighting force.

Dynamix Consulting Group strongly suggests that it is in the best interest of Middletown Township to take an active lead engaging the four volunteer fire companies to develop a coordinated combination system for the fire service within the Township. Trends nationally, within the Commonwealth, and within the Township indicate declining numbers of volunteer firefighters. It is the opinion of Dynamix Consulting Group that this trend will continue, but that the Township can have a direct impact on the rate at which this decline occurs within Middletown Township. Dynamix Consulting Group will offer a series of options for the future organizational structure of the fire services in Middletown Township in the *Long Term Opportunities and Short Term Recommendations* section of this report.

## **Internal Communication Processes**

Internally, there are a variety of methods of communications used to communicate between the Township and the four volunteer fire companies with varying levels of success. These methods include email, written memorandums, phone calls, and in-person



meetings. The chain of command within the fire services in Middletown Township is that the Township communicates with the chiefs/presidents of the volunteer fire companies and it is their responsibility to communicate to their members.

Internal communications repeatedly identified as a major deficiency within the fire services in Middletown Township during the leadership interviews, member interviews, and in the member survey. Both the leadership of the volunteer fire companies and employees both requested more engagement from the Township and better, timelier communication.

There was universal frustration voiced over a number of initiatives launched over the last several years with a perceived shortage of background information to communicate “the why.” A repeated example of poor communication within the fire services in Middletown Township was the way in which the Department of Fire and Emergency Management initiated daytime responses to emergencies.

Dynamix Consulting Group suggests that an immediate first step toward improving communications within the fire services in Middletown Township the creation of a Fire Services Communication Plan. The plan must identify the information to share, the various and specific ranks of personnel within the fire services needing the information and means of sharing the information.

The Communication Plan must then be implemented and consistently followed. The implementation of a Communications Plan manages the expectations of the membership within the fire services in Middletown Township as it relates to the type and quantity of information personnel will receive. This allows personnel to know where to direct questions they may have related to programs, policies, or other events within the fire services in Middletown Township.

## **External Communications Processes**

Externally, Middletown Township maintains a website to provide information to its customers. The Fire and Emergency Management page includes links to the website or social media pages of each of the four volunteer fire companies.

Historically, successful fire departments have used a community newsletter to communicate with the citizens of their jurisdictions. Now, these same agencies have begun to transition to social media platforms as the customer base has begun to express an expectation of digital communication and in a more real-time environment.

Dynamix Consulting recommends that the fire services in Middletown Township continue to develop its social media presence as it relates to the fire services in an effort to provide information to, and receive information from, its customers. Middletown Township should



evaluate the use of a survey tool to collect performance feedback of those citizens who have received fire services from any of the fire companies within the Township. The gathering of information directly from these individuals will allow leadership to key in on specific performance issues that allow for intervention in a timelier manner, as well as highlight those performance issues that customers indicate as being of high value.

## Recruitment and Retention Programs

Dynamix Consulting Group met with the leadership of all four volunteer fire companies in June 2021. All four volunteer fire companies were open to more collaboration with the Township. They also specifically requested a closer working relationship between the fire companies and the Township. All four volunteer fire companies were also unanimous in that they were all looking for help from the Township with the recruitment and retention of volunteer firefighters.

The volunteer fire companies have each launched a variety of recruitment and retention initiatives with varying levels of success. Recruitment efforts include but were not limited to printed and social media marketing campaigns, banners, mailings, appearances at public events, and open houses at the fire stations. Retention efforts have included a variety of monetary and other incentives including a pay-per-call program. The Township started an incentive program in 2018 that provides an annual \$250 check and \$100 credit for recreation programs for active volunteer firefighters.

People who volunteer as firefighters usually do so because they wish to provide fire and rescue services to the members of their community. The volunteer firefighters within Middletown Township have historically taken on the administrative responsibilities of their companies, but as the demand for fire service is increasing and the number of volunteer firefighters is decreasing, this is becoming increasingly more challenging for the volunteers.

Dynamix Consulting Group previously suggested that it is in the best interest of Middletown Township to immediately take an active lead engaging the four volunteer fire companies to develop a coordinated combination system for the fire service within the Township. As part of this process, Dynamix Consulting Group further suggests that the Township initiate a discussion with all volunteer fire companies about level and types of support that the Township can offer to the volunteers. This could include assistance with the recruitment and retention of firefighters, processing volunteer firefighter applications and background checks, group purchasing opportunities, and other types of administrative support. Dynamix Consulting Group will offer a series of options for Township support of the volunteer fire companies in the *Long Term Opportunities and Short Term Recommendations* section of this report.



## Health and Wellness Programs

In recent years, the fire service has become increasingly concerned with the issue of firefighter cancer, and cancer-prevention practices. Firefighters in Middletown Township have access to gear washers and dryers in the fire stations; however, not all firefighters have two sets of turnout gear. As a result, firefighters face with the decision to borrow gear or wait to wash gear until such time that they are not responding to calls. This is a regular source of concern for the full-time Fire Code Inspectors.

Dynamix Consulting Group recommends that the fire services in Middletown Township develop a plan to issue all firefighters two sets of gear or to have a stockpile of gear within the Township for use during cleaning of a firefighter's primary turnout gear. An additional preventative measure is to limit/reduce firefighter exposure to toxic products of combustion, which occur after the fire (aka, off-gassing). The fire services in Middletown Township should take steps to store all turnout gear in well-ventilated rooms to prevent additional firefighter exposure to off gassing of chemicals absorbed into turnout gear during a fire.

According to the National Fire Protection Association (NFPA), overexertion and stress causes 43% of firefighter deaths. And in 2020, the Firefighter Cancer Support Network revealed that 61% of career firefighter line-of-duty deaths occurred as a result of cancer from 2002 to 2017.

Within the fire services in Middletown Township, there were varying types of medical exams provided for new and existing firefighters and Fire Code Inspectors. Dynamix Consulting Group recommends that there be established a single Township-wide annual medical evaluation program that applies to all personnel who perform fire and rescue activities. This medical evaluation program should comply with NFPA 1582: *Standard on Comprehensive Occupational Medical Program for Fire Departments*. Additionally, the fire services in Middletown Township should consider emphasizing health and wellness programs for its firefighters and inspectors because of an increased risk for cardiovascular disease and certain types of cancer in the fire service. Prevention programs and health monitoring provide cost savings to fire organizations, reducing workers' compensation costs, sick leave/overtime hiring costs, and improves the overall mental and physical health and wellness of first responders.





## Safety Committee

In addition to providing annual medical evaluations, the fire services in Middletown Township should establish a Fire Service Safety committee in alignment with Chapter 4 of NFPA 1500: *Standard on Fire Department Occupational Safety, Health, and Wellness Program*. The establishment and empowerment of a safety committee can be one of the best tools to increase the safety of firefighters.

The Fire Service Safety Committee should be comprised of members from all the volunteer fire companies as well as the Department of Fire and Emergency Management. This committee should meet at least monthly and include in its mission the raising of awareness and modifying of member behaviors that will result in a safe work environment. Additionally, the committee should review all accidents, injuries, near-miss incidents, and workplace safety suggestions. The committee should analyze the information before them and report their findings to all of the fire chiefs within the Township. In contrast to being reactionary through the development of additional rules, the committee should work to implement member safety education programs and encourage members' safety self-awareness. The committee should maintain regular and open meeting times and locations, and minutes of the meetings recorded and posted for all firefighters to review. Dynamix Consulting Group underscores the importance of maintaining a functioning Safety Committee.

## Management of the Department of Fire and Emergency Management

During the course of the fieldwork, Dynamix Consulting Group found a number of personnel issues in Middletown Township. Dynamix Consulting Group communicated these issues directly to the Township Manager's Office independent of this *Fire Services Study*.

As it relates to the Department of Fire and Emergency Management, Dynamix Consulting Group has identified the need for Middletown Township to determine whether its Fire Code Inspectors will continue to perform emergency response activities in the future. Dynamix Consulting Group will offer a series of options for the future role of the Fire Code Inspectors in the *Long Term Opportunities and Short Term Recommendations* section of this report.

As Teamsters Union Local 107 represent Middletown Township Fire Code Inspectors, once the future rule of the Fire Code Inspectors is determined, the Township should engage the union to update the contract to include appropriate job descriptions, working conditions, training requirements, and compensation levels.



## 8. SERVICE DELIVERY & PERFORMANCE

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One of the most visible elements of a fire department is response performance. How quickly units arrive on scene and the efficiency with which they resolve emergencies could be the only interaction most residents will have with the organization. For Middletown Township, four volunteer fire companies provide suppression services from six fire stations, Township employees respond during the workweek, and a combination of paid and volunteer employees provide the ambulance service. Since the intent of this study is to provide a wholistic view of fire and rescue services for the Township, evaluators combine some elements while others separated by individual company as needed.

### Service Demand Review

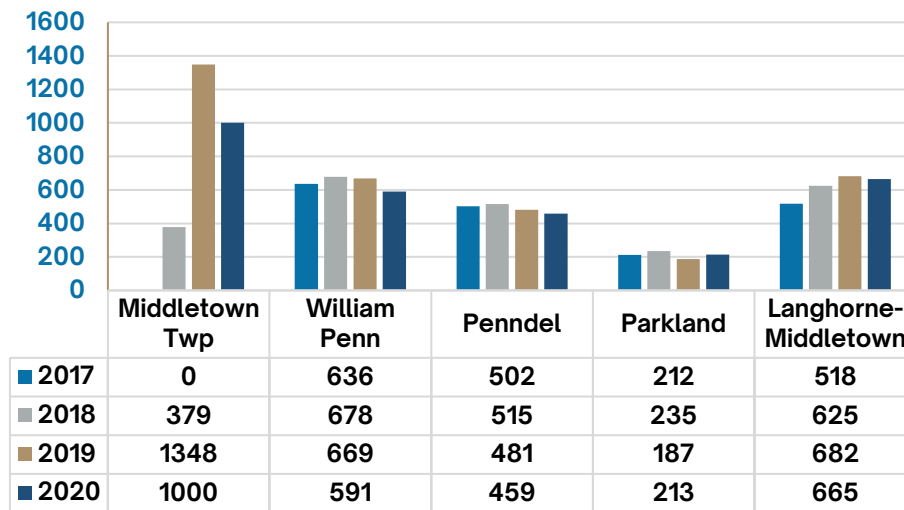
Demand for services is what drives the need for public safety organizations. As service demands and demographics of the community change over time, so too should the fire and rescue companies. This section provides an overview of total demand for Middletown Township, as well as call volume for individual companies providing services. Not all data is uniform, due to varying degrees of data from multiple agencies, over various timeframes available for analysis. Dynamix Consulting Group suggests that Middletown Township purchase and make available a common Record Management System (RMS) for use by all companies providing services to the Township and allow for consistent analysis and data management for the future. The Middletown Township Fire & Emergency Management/244 (Fire Code Inspectors) established in mid-2018. The Fire Code Inspectors currently respond to calls Monday through Friday within all areas of Middletown Township and four boroughs regardless of the fire company serving that area. Finally, although not included in the original scope of this project, the 2020 annual service demand for the PennDel-Middletown Emergency Squad is included to provide context to the total fire and rescue service demand served in and around Middletown Township.

Limitations within the data include the elimination of the call type 400 – Hazardous Condition, other, from the Middletown Township Fire Code Inspector’s records for 2020 as these specific call types appeared to represent crews providing cleaning services to other agencies and not actual emergency responses. This call type accounted for 955 responses within the data and when included nearly doubled service demand from the previous year. Additionally, William Penn maintains two RMS systems and records responses from each station as standalone incidents. The resulting totals represent annual demand when removing duplicate dispatch times and addresses from the dataset. Finally,

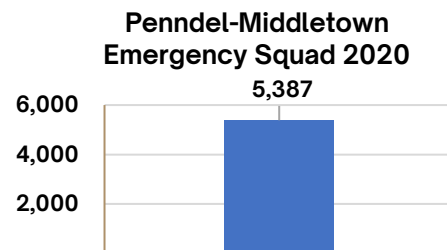


in the summer of 2020 Langhorne-Middletown experienced a ransomware data loss resulting in a loss in much of their data prior to late 2016. Although the department worked diligently to restore as much data as possible, the spike in demand from 2017 to 2018 may be due to that loss. Due to the varying conditions, formats, and multiple datasets received, these results may vary from what each individual company has reported for annual call totals.

**Annual Demand for Services by Fire Department 2017-2020**



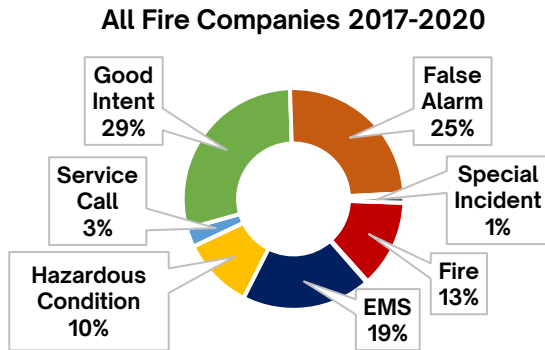
In 2020, the COVID-19 pandemic affected nearly all U.S. fire rescue service providers by reducing demands for services beginning in late March of 2020 through the middle of that summer. This impact in Middletown Township appears in the reduction of annual service demand from 2019 to 2020. Overall, service demand per fire company appears to be relatively stable year to year, given the data limitations described. Because Penn del-Middletown Emergency Squad (PEMS) provided only one year of data, a year-to-year comparison was not possible; however, with an annual service demand nearly double that of all fire companies serving Middletown Township for 2020 combined, monitor this essential service as they face similar challenges as volunteer fire departments.





Finally, based on the mission and services provided, the types and numbers of responses by a fire department can vary. Researchers classified each incident using the National Fire

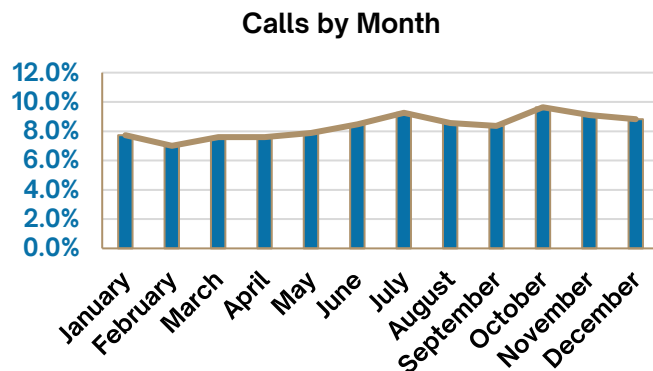
Incident Reporting System (NFIRS) by the respective fire company and includes the totals for all companies in the illustration. Of particular note, if the total EMS calls by PMES in 2020 replace fire EMS responses and become part of the total, EMS calls represented 69.6% of all fire rescue demand for Middletown Township and the surrounding areas.



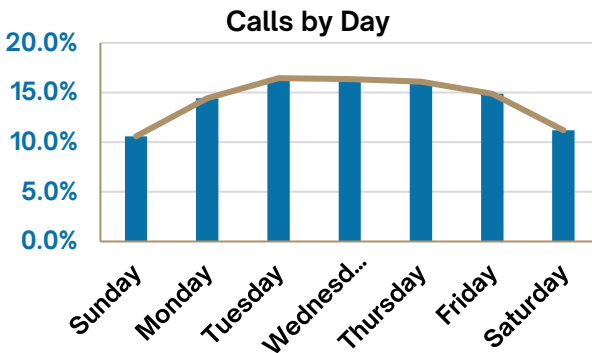
## Temporal Variation

Researchers describe the patterns that occur over time by the temporal variation. When analyzing and tracking data over time, these patterns can provide valuable insight as to when demands for services are greatest and when they are at their lowest. This is particularly important for Middletown Township as they currently provide weekday response staffing to supplement volunteer company response. When these Fire Code Inspectors begin and end their respective workdays can have a dramatic impact on the reliable delivery of services.

First displayed is the temporal variation from 2017 through 2020 by month for all fire companies. The pattern shows an increase in demand beginning in May that peaks in October then declines to its low in February. The analysis includes four years of data to smooth any inconsistencies year to year; however, the additional call volume serviced by the Fire Code



Inspectors in the second half of 2018, the COVID-19 impact from March to approximately June of 2020, and the short month of February may be contributing to this pattern. Generally speaking, demand for services is fairly consistent month to month with an average 70 calls per year for all departments combined occurring between the high in October and low in February.



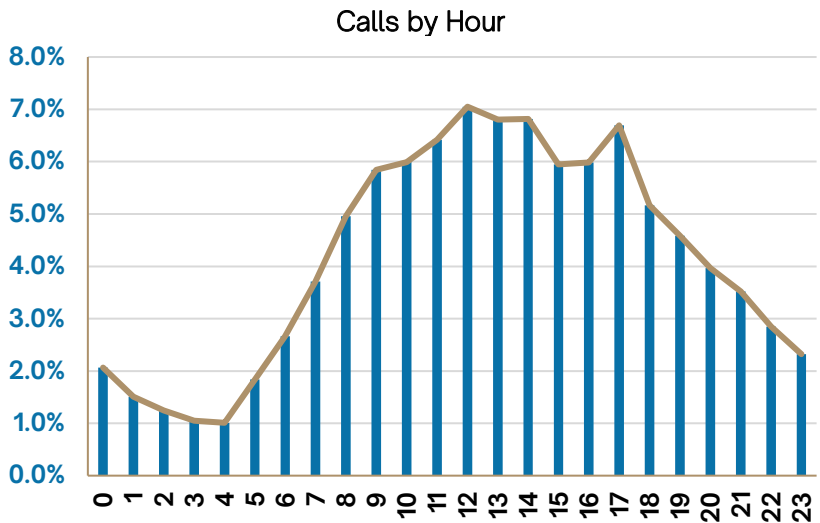
Next, the demand patterns by day of week are illustrated. The pattern seen is common across most fire departments nationwide due to the increase in activity during the workweek. Additionally, with the Fire Code Inspectors supplementing volunteer companies Monday through Friday, this graph suggests that those are appropriate days for the Township to

provide that staffing as they are the busiest days of the week. Demand increases 55.3% from the low on Sundays to the highs on Tuesdays and Wednesdays before trailing off again on the weekend. Although demand is considerably lower on weekends, monitor volunteer company responses, and level of service trigger points adopted by the Township in advance. If at some point performance declines to a level necessitating where paid staff must supplement volunteer companies on weekends and holidays, the Township should be prepared to fulfill that need and maintain reliable delivery of services.

Finally, variation by hour of day is shown. In the prior two graphs, support for providing paid crews during the workday year-round was described; however, in this graph information about which hours paid crews should be staffed can be observed. Like volunteer firefighters across the country, the volunteers in the Middletown Township area are typically unavailable from 6 a.m. to 6 p.m. during the workweek. Additionally, family activities often occur from 6 p.m. though 8 p.m., and consistent interruptions due response requirements can make it difficult for a volunteer to consistently response or stay active within the company.



In Middletown Township, service demand begins to climb at 5 a.m., peaks at noon, and sharply tapers off after 5 p.m.



The 12-hour block from 8 a.m. until 8 p.m. represents 72.3% of service demand in Middletown Township

The Township may consider options such as a staggered schedule where employees report for work at different times to ensure maximum coverage, particularly during peak

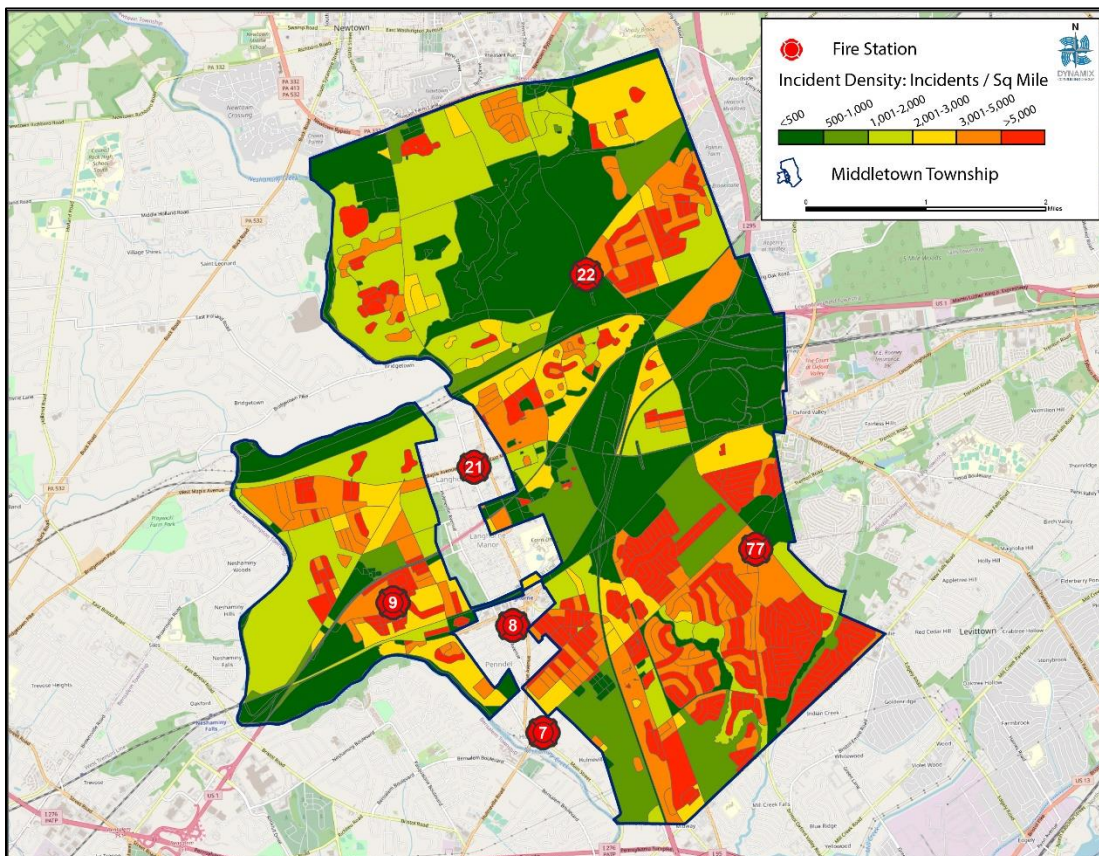
demand. An example of this would be half of the employees working from 8 a.m. to 4 p.m. and the other half from noon to 8 p.m., providing maximum coverage during the busiest hours of the day. Another option is a split schedule where half of the employees work from 6 a.m. until 2 p.m. and the other half work from 2 p.m. to 10 p.m. Monday through Friday. In either case, prior to modifying shift schedules or deployment strategies, the Township must first identify the minimum staffing requirements desired and the hours in which the Township needs supplemental staffing. Additional considerations include where employees deploy from and how these locations correspond to areas of greatest demand during the workweek as responding fewer firefighters from multiple locations will improve initial response performance as opposed to all employees responding from one location. NFPA 1720 calls for a minimum of 15 firefighters to arrive on a fire scene within 9 minutes of initial notification 90% of the time for urban areas (populations <1,000 people/square mile) and 10 firefighters to arrive on scene within 10 minutes of initial notification 80% of the time for suburban areas (populations 500-1,000 people/square mile). Staffing resources across a given district to improve initial response performance is a common industry best practice.



## Population Density and Geographical Demand

One of the best predictors for service demand is population density. It stands to reason that the more people there are concentrated in a given area, the higher demand would be for that area given a consistent per capita rate of requests for services. While the specific demographics of a population can also affect the frequency of service requests, an understanding of the distribution of population densities is a fundamental element of developing an optimized deployment strategy. For incidents such as fires or major medical events such as cardiac arrest or severe traumatic injuries, the speed in which first due resources can reach the incident scene will have a dramatic effect on the responder's ability to resolve the event with a positive outcome. First, displayed is the population density of Middletown Township by US Census Blocks using 2020 American Community Survey (ACS) estimates.

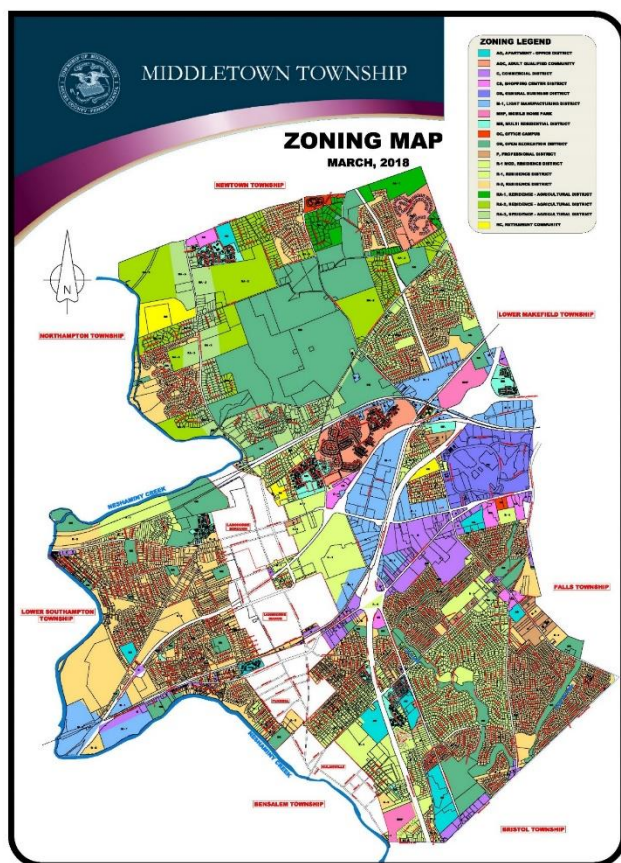
Incident Density by US Census Blocks, 2020





Areas of densest concentration occur in the southeastern portions of the Township. While there are pockets of dense population scattered throughout, wooded or agricultural areas separate these dense populations, which will make it more difficult to provide uniform coverage throughout the Township with current Fire Code Inspectors staffing. While population density is typically a strong indicator of where demands for services will occur, the density and patterns of concentration, and distribution, provide an additional point of comparison for where best to situate limited resources.

Commercial and high traffic areas often possess increased levels of demand despite having low resident populations. Depending upon the way that urban and suburban areas



develop and their corresponding demographics, commercial areas can possess the highest levels of service demand, despite having almost no residents in the area.

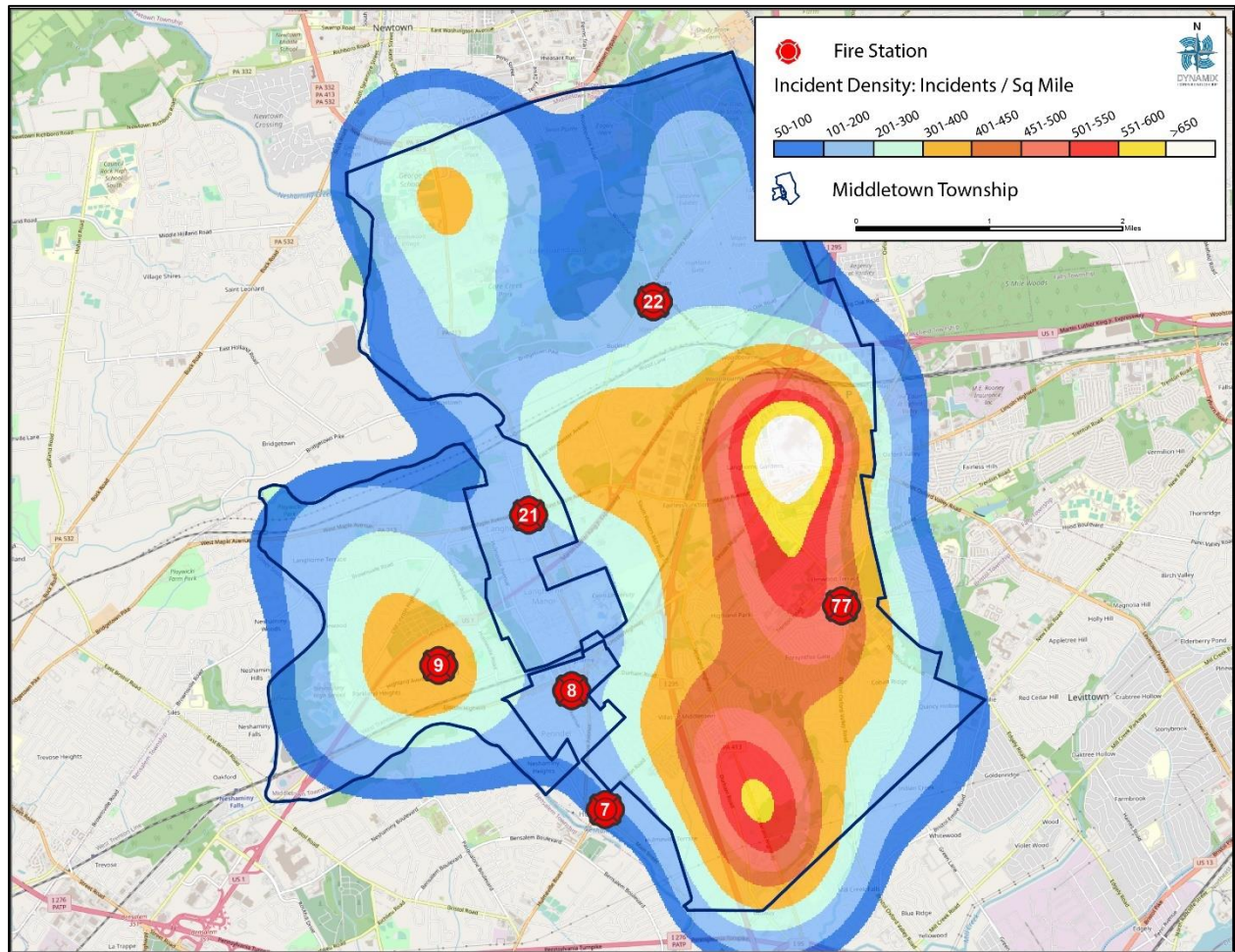
To determine how commercial areas impact service demand within the Township, researchers used GIS software to conduct an incident density analysis, or Hot Spot analysis. Law enforcement agencies use this as a method to identify areas of densest activity relative to other areas. While other areas may have a greater overall call volume, hot spots appear when multiple incidents occur very near each other. This analysis does not suggest that a certain number of calls occurred in each area, but instead provides a way to compare incident density in different areas across the jurisdiction. Below is a Hot Spot analysis

using incident data from 2017 through 2020 for all fire department responses within the Township.





## Middletown Township Hot Spot Analysis 2017-2020

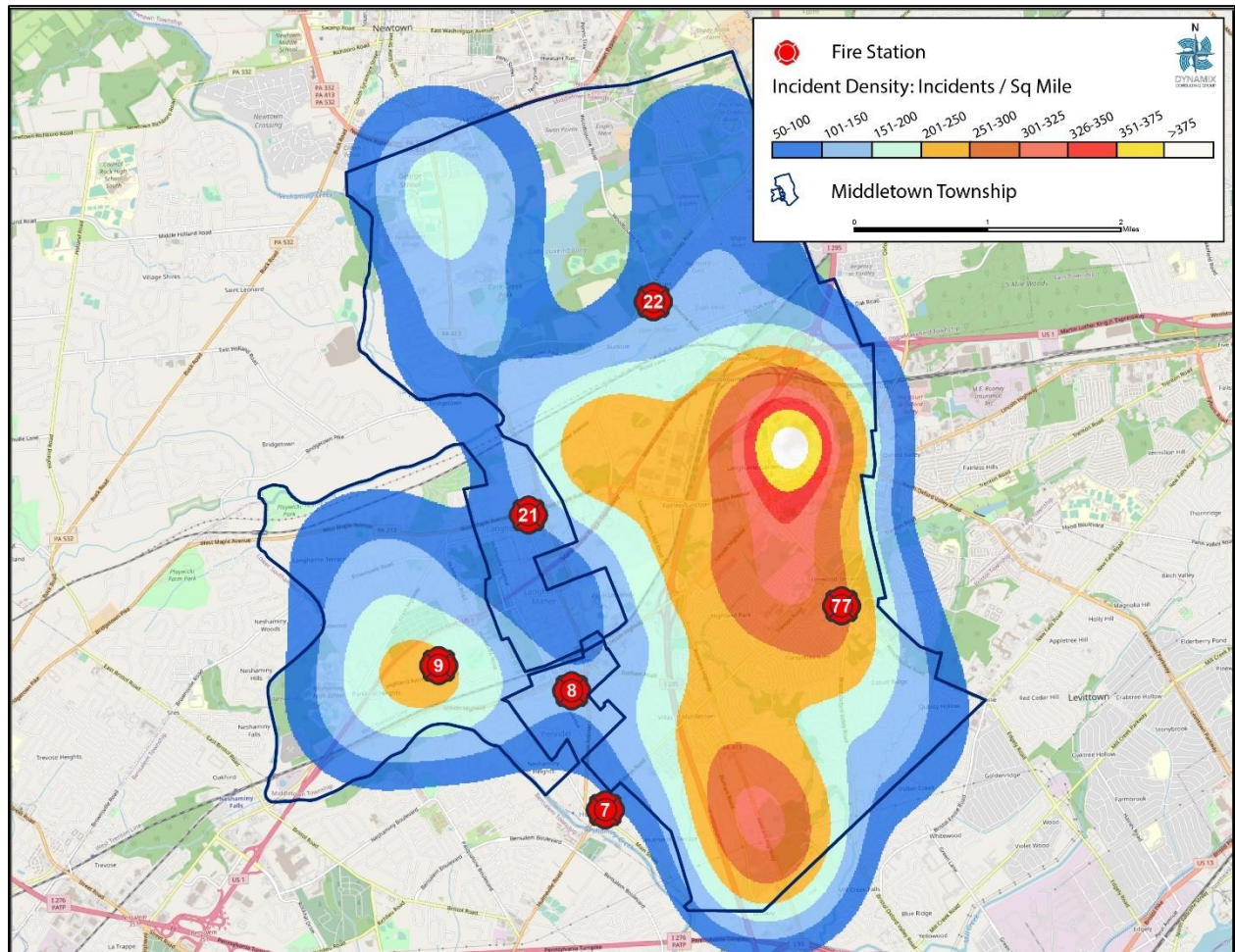


When comparing the overall Township analysis with the population density, hot spots in the southern and western portions of Middletown Township align with areas of high population density; however, the densest area of incident activity within the Township occurred in an area of low population density, but greater commercial activity.

When comparing the overall incident density analysis with an analysis using only those incidents occurring from Monday through Friday, 8 a.m. to 8 p.m., a similar result emerged.



## Middletown Township Hot Spot Analysis, Monday-Friday, 8 a.m.-8 p.m., 2017-2020



Although these analyses provide information regarding where the greatest incident densities are occurring throughout the Township, this information should not stand alone when developing deployment options and optimizations. However, these figures do demonstrate that the strategic location of some facilities have advantages for current service demand than others.



## Resource Distribution Analysis

The distribution of available resources is one of the key methods to providing higher levels of service to the greatest number of residents possible. In this section, the fire departments within Middletown Township are evaluated as a system to provide Township leadership with a broad understanding of the distribution of available resources and how the different fire companies potentially interact and supplement each other. There are two main industry standards for evaluating and benchmarking fire department performance. First, is the National Fire Protection Association (NFPA) 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency medical Operations, and Special Operations to the Public by Volunteer Fire Departments*. Second, is the Insurance Services Office (ISO), which uses proprietary evaluation criteria based on NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency medical Operations, and Special Operations to the Public by Career Fire Departments*. The Middletown Township system meets the definition of a combination system, as it is comprised of both career and volunteer elements. While NFPA issues specific standards for career and volunteer fire departments, no specific standard exists for combination fire departments, which are composed of a combination of career and volunteer resources. The defining characteristic for a combination fire department is that it possesses emergency services personnel at less than 85% of the majority for either type. Combination fire departments can also choose which standard to apply to their organization. For the purposes of this report, NFPA 1720 is the appropriate standard for which to benchmark performance.

### NFPA 1720 Criteria

In most cases, career fire departments serve metro, urban, and suburban areas (although exceptions exist) while combination and volunteer organizations generally serve suburban and rural jurisdictions. In recognition of this, NFPA 1720 provides varying levels of response goals based upon the population density of the jurisdiction, while NFPA 1710 applies equally in all cases. For urban population densities, NFPA 1710 and 1720 both require a 9 minute response time from initial notification to assemble enough firefighters to mitigate a moderate risk safely and effectively, such as a working fire in a 2,000 square foot single family residential occupancy. The main differences between the two standards are that NFPA 1710 provides for travel time criteria for the first arriving company and 16 or 17 firefighters depending on whether a ladder company is present.

Unlike NFPA 1710, performance standards for NFPA 1720 are specific to fire suppression. The Authority Having Jurisdiction (AHJ), which is typically the fire chief or similar position,



determines performance standards for other incident types, such as EMS or responses to remote areas of the jurisdiction.

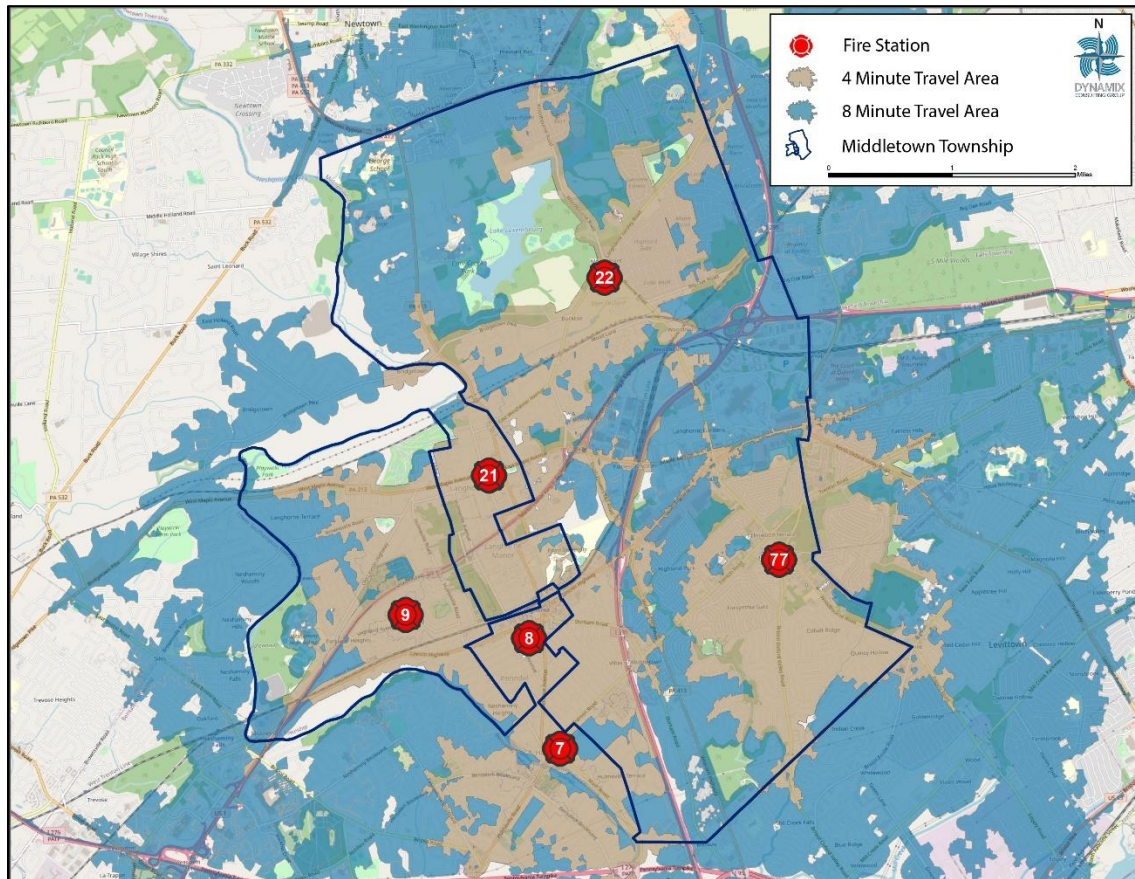
NFPA 1720 Table 4.3.2 Staffing and Response Time

Demand Zone	Demographics	Minimum Staff to Respond	Response Time (minutes)	Meets Objective
Urban Area	> 1,000 people/mi <sup>2</sup>	15	9	90%
Suburban Area	500–1,000 people/mi <sup>2</sup>	10	10	80%
Rural Area	< 500 people/mi <sup>2</sup>	6	14	80%
Remote Area	Travel distance ≥ 8 mi	4	Directly dependent on travel distance	90%
Special Risks	Determined by AHJ	Determined by AHJ based on risk	Determined by AHJ	90%

For 2021, Middletown Township has an estimated population of 44,956 and a total land area of 18.89 square miles. Overall, this is a population density of 2,380 per square mile, considered an urban response area for NFPA 1720. As both the NFPA career and volunteer standards are similar regarding response time, four- and eight-minute projected travel times are shown to provide an understanding of how the current arrangement of fire stations can provide coverage to the Township based on their locations.



## Middletown Township Projected 4- and 8-Minute Travel Time



When the current fire station locations and projected travel performance are observed, stations 7, 8, and 21 were clearly sited to serve the boroughs of Langhorne, Langhorne Manor, Penndel, and Hulmeville at a time when demand in those areas were greatest. Although these stations can and do provide fire services to Middletown Township, these locations are not sited to provide the Township coverage nearly as well as stations 9, 22, and 77. Interestingly, the area of densest incident activity in the general business, commercial, and manufacturing districts lie outside of a four-minute response by any existing fire station.



## ISO Criteria

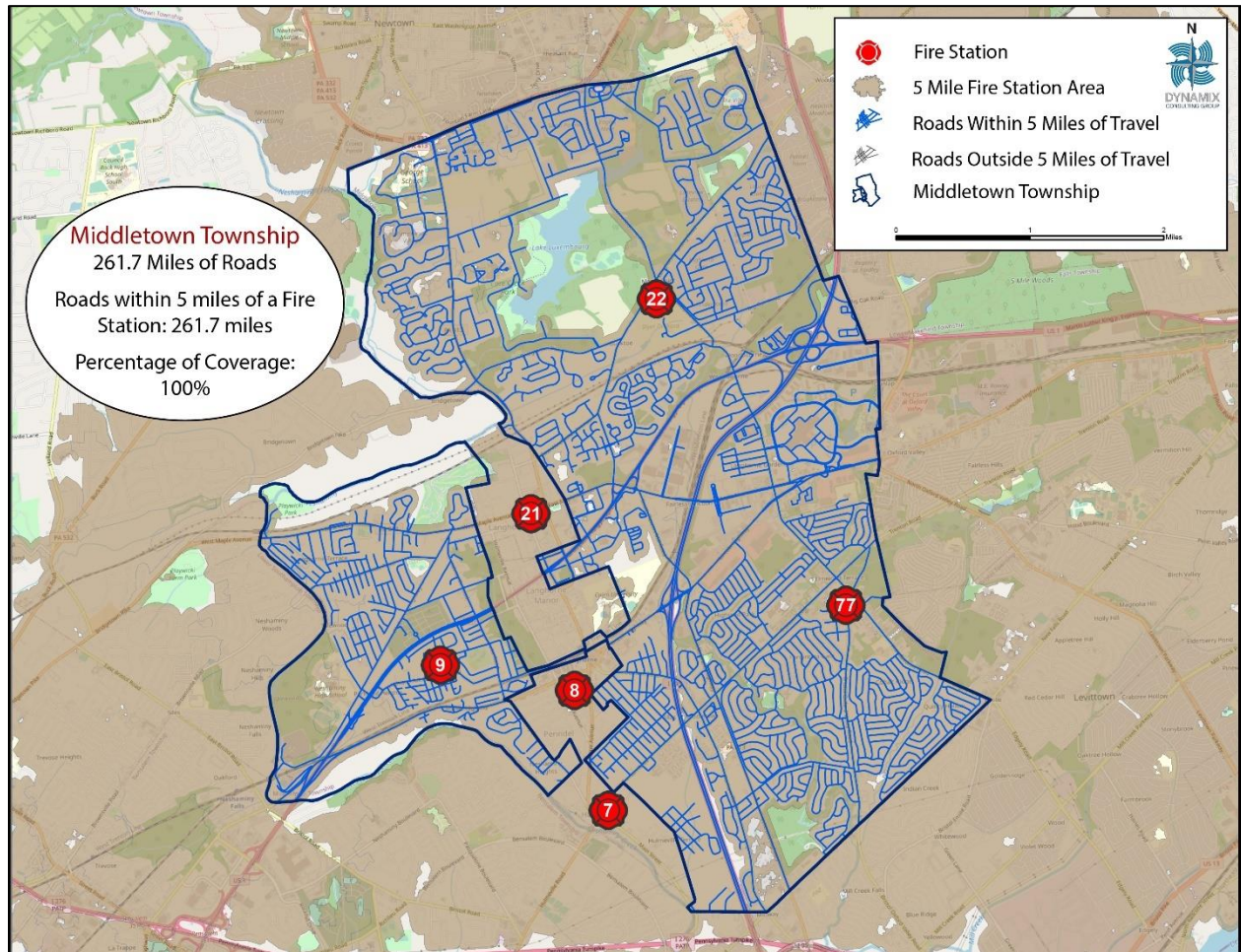
The Insurance Services Office (ISO) is a New Jersey-based advisory organization that provides insurance carriers with a classification rating of a local community's fire protection. The Property Protection Class (PPC<sup>®</sup>) score or rating classifies communities based upon an overall scale of 1 (best protection) to 10 (no protection) and assesses all areas related to fire protection. These areas are broken into four major categories, which include: emergency dispatch and communications (10 percent of the rating), water supply system and distribution capabilities (40 percent), the fire department (50 percent), and Community Risk Reduction efforts (an additional 5.5 percent credit is available above 100 percent).

## ISO Fire Station Coverage

In order to receive a PPC<sup>®</sup> rating that indicates fire coverage is available from ISO, structures must generally be located within 5-miles of a fire station. Areas outside of 5-miles are subject to receiving a PPC<sup>®</sup> rating of 10, meaning that no fire department coverage is available. For Middletown Township, all areas are within a five-mile travel from a fire station and are eligible for an ISO fire protection rating.



## ISO 5-Mile Fire Station Coverage

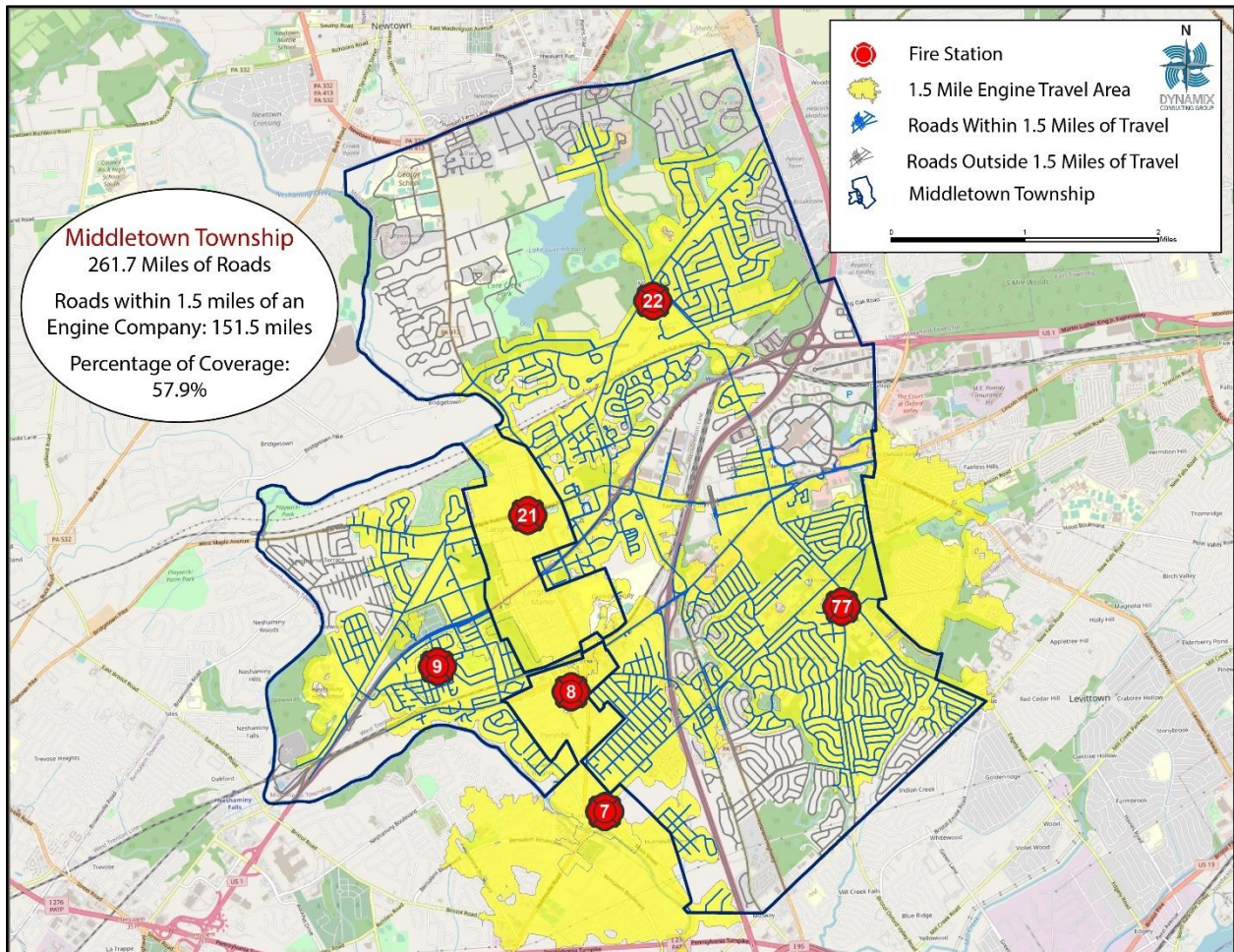




## Engine Company Criteria

A key area of credit towards a jurisdiction's PPC® score is the degree to which structures protected by the fire department fall within a 1.5 road mile service area of a fire station. This 1.5 road-mile standard is used to estimate a 4-minute travel time for first responding units as required by NFPA 1710. ISO does not differentiate between career and volunteer fire departments and applies NFPA 1710 standards uniformly in all evaluations. If evaluating Middletown Township as a system, approximately 58% of the Township would be within a 1.5-mile engine company coverage area or approximate four-minute travel.

ISO 1.5-Mile Engine Company Service Area



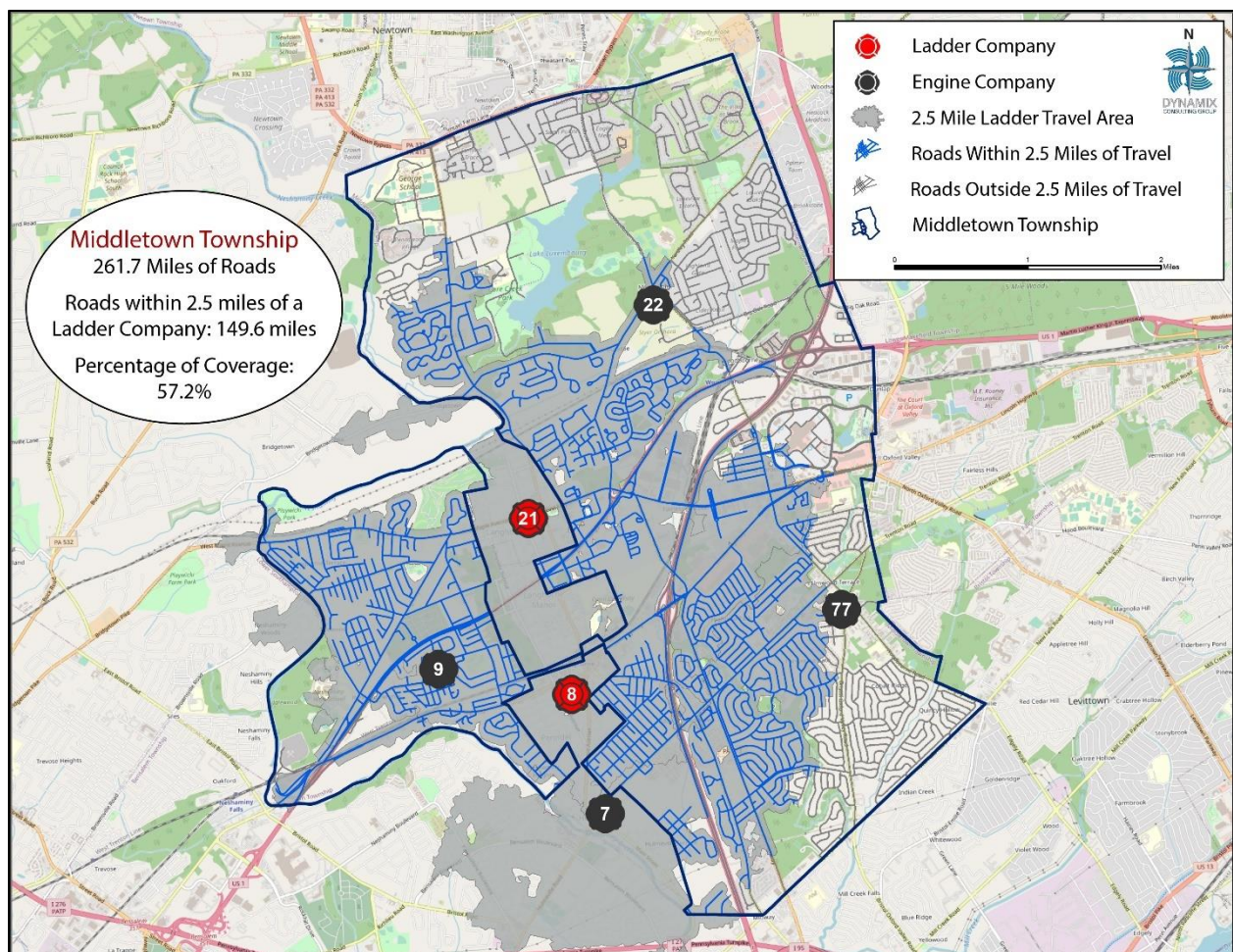




## Ladder Company Criteria

In many jurisdictions across the country, ladder companies are deployed only to certain types of incidents and are not necessarily considered as the first due unit for all other incident types. Because of this, ISO uses a 2.5 road-mile travel distance for ladder companies to estimate an 8-minute travel time in urban and suburban areas by ladder companies to provide the balance of personnel and equipment needed for incidents such as working fires. For the Township, 57.2% coverage is available by a ladder company; however, the majority of this coverage extends primarily over residential areas and does not reach all of the Township's major business and commercial areas in the east-central portion of the Township. Additionally, the ladder companies are positioned 1.7 miles apart and outside of the Township's municipal boundaries.

ISO 2.5-Mile Ladder Company Service Area

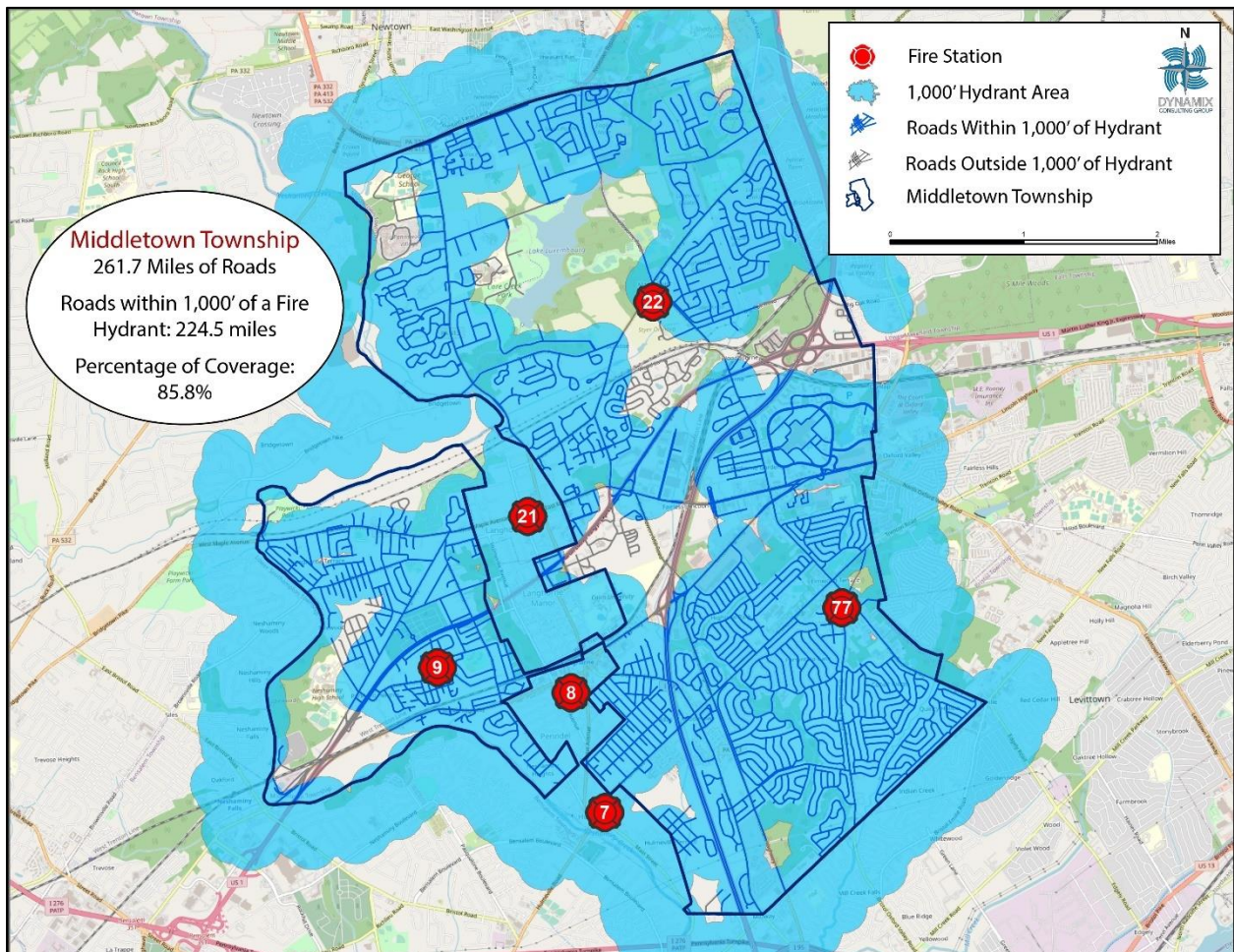




## ISO Fire Hydrant Water Supply

Access to water is a fundamental requirement for fire suppression in urban settings. Without an adequate supply of water, fire suppression operations are challenging. Additionally, the access point for this water supply must be located close enough to the structure to allow for rapid access by the fire department. ISO uses a 1,000-foot radius around fire hydrants to establish a baseline for a structure's accessibility to water. This is because fire companies typically carry a minimum of 1,000 feet of supply hose used to connect to a water supply. Areas in Middletown Township lacking water supply by fire hydrants are primarily commercial with a mix of residential.

ISO 1,000 Foot Radius from a Fire Hydrant Coverage





## Response Reliability

No matter how many fire stations or apparatus are positioned within a community, if crews are committed to other tasks, incidents, or otherwise unavailable an emergency response could be delayed or not occur at all. Resource reliability is evaluated using several metrics to establish a global perspective on Middletown Township’s ability to provide sufficient responding resources to meet service demand within the Township. When all units are available and in quarters, supplying sufficient resources is typically not a problem; however, when multiple calls occur simultaneously, units are committed to incidents for extended periods, or when insufficient resources exist to mitigate an emergency, further preparation and planning safely and effectively must be completed.

## Call Concurrency

The first evaluation is call concurrency. Call concurrency is a comparison of how often multiple calls are occurring and placing additional demand on resources. In the next figure, a concurrent call is identified when a second unit is dispatched to a separate incident prior to the first unit clearing the scene and becoming available. When two incidents are occurring simultaneously and a third separate incident is dispatched, three concurrent calls are present, and so on.

Call Concurrency 2017-2020

Call Concurrency	
Single Incident	62.6%
2	20.2%
3	8.5%
4	4.9%
5	2.5%
6 or more	1.3%

For most incidents in Middletown Township, only one call is occurring at a time; however, approximately one third of the time multiple incidents are occurring simultaneously and available resources are depleted. Call concurrency is particularly important for the Fire Code Inspectors and for volunteer companies, as during the workweek resources outside of the initial responding units are scarce. Call concurrency is a metric used in conjunction with other indicators as a trigger point for when to add additional crews or extend hours of staffing.



## Unit Hour Utilization

Another component considered when evaluating resource reliability is Unit Hour Utilization (UHU). UHU provides an expression of the workload placed on the crew assigned to that unit and describes the amount of time that a unit is not available for response because it is already committed to another incident. The larger the percentage, the greater its utilization, and the less available it is for assignment to subsequent calls for service, training, and ancillary duties. UHU rates are expressed as a percentage of the total hours in a year.

In May 2016, Henrico County (VA) Division of Fire published an article after studying its department’s EMS workload. As a result of the study, Henrico County Division of Fire developed a general commitment factor scale for its department. The next figure is a summary of the findings as it relates to commitment factors.

**Commitment Factors as Developed by Henrico County (VA) Division of Fire, 2016**

Factor	Indication	Description
0.16–0.24	Ideal Commitment Range	Personnel can maintain training requirements and physical fitness and can consistently achieve response time benchmarks. Units are available to the community more than 75% of the day.
0.25	System Stress	Community availability and unit sustainability are not questioned. First-due units are responding to their assigned community 75% of the time, and response benchmarks are rarely missed.
0.26–0.29	Evaluation Range	The community served will experience delayed incident responses. Just under 30% of the day, first-due ambulances are unavailable; thus, neighboring responders will likely exceed goals.
0.30	“Line in the Sand”	Not Sustainable: Commitment Threshold—the community has less than a 70% chance of timely emergency service and immediate relief is vital. Personnel assigned to units at or exceeding 0.3 may show signs of fatigue and burnout and may be at increased risk of errors. Required training and physical fitness sessions are not consistently completed.

Due to the nature of the Records Management System (RMS) used by the Middletown Township fire departments, an evaluation of unit hour utilization was not possible. In the future Middletown Township may consider adding additional elements to an RMS that will allow for the tracking of individual unit and crew response metrics to provide an accurate assessment of crew activity rates.



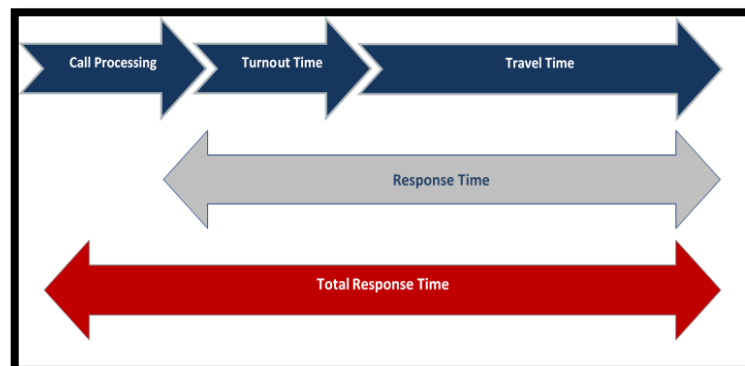
## Response Performance Summary

The most visible element of a fire department is its response performance. How quickly units arrive on scene and the efficiency with which they resolve an emergency are typically the only interaction most residents will have with the fire department. To evaluate the Middletown Township system performance, NFPA 1720 is the applicable standards for volunteer and combination fire departments.

Response time performance is comprised of the following components:

- **Call-Processing Time:** The amount of time between answering a call by the 911 Primary Public Safety Answering Point, or dispatch center, and dispatching of resources.
- **Turnout Time:** The time interval between response unit notification of the incident and apparatus response.
- **Travel Time:** The amount of time the responding unit actually spends on the road traveling to the incident until arrival at the scene. This is a function of speed and distance.
- **Response Time:** This time calculation is from the time of dispatching the fire department to the arrival of the first apparatus. Response Time equals the sum of “Turnout Time” and “Travel Time.”
- **Total Response Time:** This is the most apparent time to the caller requesting emergency services. Total response time is the amount of time that occurs from the time they place the emergency call until units arrive. This time often includes factors both within and outside the control of the fire department, particularly when another agency provides dispatch services.

Tracking the individual components of response time will enable Middletown Township to identify deficiencies and areas for improvement. Once the current performance for Call Processing, Turnout Time, and Travel Time are understood, this information can be used to develop response goals and standards that are both relevant and achievable. Fire service best practices recommend that fire service organizations monitor and report the components of Total Response Time.





The Time Continuum is comprised of the three elements described above—Call Processing, Turnout Time, and Travel Time. Response Time is a combination of Turnout and Travel Time, and Total Response Time is the sum of all the times starting with the Call-Processing Time, Turnout Time, and Travel Time. The components of the Response Time Continuum will each be discussed in further detail in the next sections and results provided where data was available.

Historically, fire rescue service providers have used the performance measurement of average response to describe the levels of performance. The average is a commonly used descriptive statistic, also called the mean of a data set. Averages may not accurately reflect the performance for the entire data set because data outliers can significantly skew averages, especially in small data sets. One extremely good or bad value can skew the “average” for the entire data set. Percentile measurements are a better measure of performance since they show that most of the data set has achieved a particular level of performance. The 90th percentile means that 90% of responses were equal to or better than the performance identified, and that the other 10% are data outliers, inaccurate data, or situations outside of normal operations that delayed performance. This can be compared to the desired performance objective to determine the degree of success in achieving the goal.

An important consideration when evaluating fractile performance is that the results of each category are not additive, meaning that the sum of two or more constituent metrics cannot be simply added together to find the sum. This is because each dataset is discrete and as such must be observed individually, particularly when data quality is an issue. If a metric, such as response time possesses the majority of its data points, while turnout time is not accurately documented, a significant difference can exist between the response time calculated using the fractile descriptive and the sum of turn out time and travel.

In evaluating the various response time components using the fractile analysis method, each component must be evaluated and quantified separately, as the available data—and the quality of the data may vary significantly.

To provide an analysis of performance for emergency calls within Middletown Township, the following assumptions occur:

- Non-emergency incident types were removed
- Mutual and auto aid given were removed
- Other aid given were removed
- NFIRS call types within the 500, 600, 800, and 900 series were removed
- Cells containing zeros or no value were removed



Additional limitations within the data included rounding time stamps to whole minutes. This practice prevents an accurate assessment of performance, depending on how numbers are rounded, nearly two minutes of error could be present for any given metric. Middletown Township should require that accurate time metrics including seconds be documented for all responses by all companies moving forward.

## Call Processing Time

The industry standard for call processing (or alarm handling) is NFPA 1221: Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems. This standard provides for communication centers to have processing times of not more than 60 seconds, 90% of the time. For special operations, calls requiring translation, or other factors described in the standard, times should not exceed 90 seconds at the 90th percentile. Middletown Township does not have direct supervision over the initial processing and transferring of emergency calls, so these performance measures are not within its control. Bucks County Emergency Communications handle this component of the process. Dynamix Consulting Group recommends that Middletown Township actively work with the communications center to ensure compliance with NFPA 1221.

Evaluation of the Township's fire companies 2017-2020 data revealed that the records management system does not capture call processing times. Without this information, neither the fire departments nor the Township can develop an understanding of the call center's performance and ultimately the experience of the caller requesting emergency assistance. Call processing performance directly affects each fire department's ISO rating, as well as the level of service experienced by the community. Additionally, without an understanding of how the communications center is performing, Middletown Township lacks the information needed to determine if funding provided to the county for emergency communications services is meeting their needs. Middletown Township should regularly request and review Bucks County Emergency Communications performance.

## Turnout Time Performance

The second component of the response continuum, and one directly affected by response personnel, is turnout performance. Turnout is the time it takes personnel to receive the dispatch information, move to the appropriate apparatus, and begin responding to the incident.

In staffed stations, NFPA 1720 calls for a 90th percentile turnout performance of 90 seconds for fire and special operations calls. For unstaffed stations, the AHJ determines the turnout time goal.



To capture turnout time performance, the time that a unit went “enroute” or “responding” is needed. This metric is not currently collected or tracked in the Middletown Township volunteer fire departments and was only sporadically available for part of 2018 and 2019 for the Fire Code Inspectors. Middletown Township should require turnout times to be documented and verified and performance of crews regularly monitored. While NFPA 1720 does not provide recommendations for turnout times in unstaffed stations, this information is invaluable in understanding system performance.

## Travel Time Performance

The third component of the response continuum is travel time. It is important to understand that travel time is not specifically a factor of speed as much as it is the result of proper placement of fire stations from which emergency responses begin. Travel time is the amount of time between when the apparatus departs for the call and when it arrives on scene. The measurement is at the 90th percentile. NFPA 1720 has no requirements for travel time; however, without an understanding of travel time performance, it can be difficult to determine whether projected and actual performance are on par with one another. Traffic congestion, construction, and the condition of the road network are all potential factors in delaying a response.

As previously discussed, since enroute times are not recorded, it is not possible to determine travel time to emergency incidents. Although NFPA 1720 does not provide a standard for travel time, travel and turnout times are the constituent elements of Response Time. Middletown Township should require the documentation of enroute times and regularly review and evaluate this information.

## Response Time Performance

Response time is the amount of time from initial notification to the fire department until the first unit arrives on-scene. NFPA 1720 specifically addresses this metric and is a combination of turnout and travel time where 15 firefighters arrive on scene within 9 minutes of initial notification 90% of the time for hazards such as fires. For EMS and other responses, the AHJ establishes the goal.

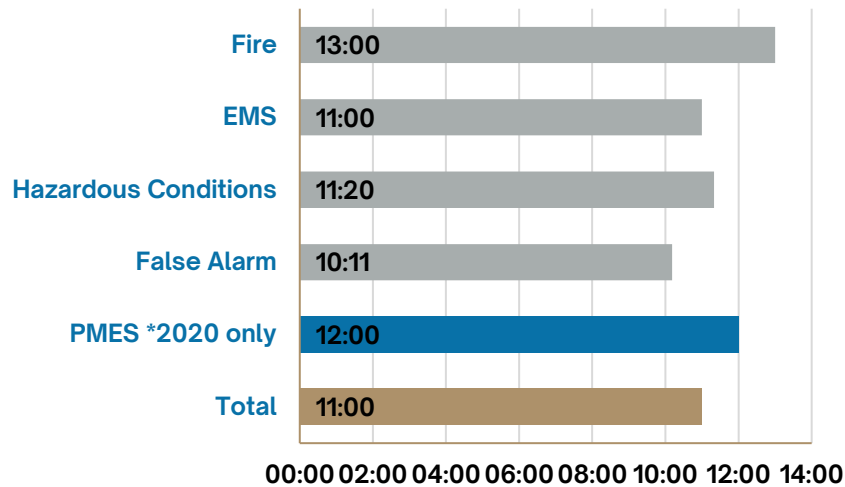
Response time performance is the calculation of the difference between the initial notification time and the arrival time. As previously mentioned, the majority of time stamps were rounded to a whole minute, although some exceptions were present within the datasets. Due to the variability within the data, it was not possible to determine how many firefighters actually arrived on working fire scenes or how long it took to assemble an effective response force to those incidents. However, given the performance of the first





arriving unit at the 90<sup>th</sup> percentile to fires was 13 minutes, it is doubtful that Middletown Township fire departments are meeting NFPA 1720 standards. For this evaluation, only incidents occurring within Middletown Township were evaluated and nonemergent or irregular call types such as service calls, good intent, severe weather, and special incidents were excluded from the calculations. PMES response time is displayed for informational purposes only.

**Middletown Township Fire and Ambulance Response Performance 2017-2020**



Due to the lack of turnout and travel performance metrics, it is not possible to determine if the extended response times are due to turnout, travel performance, or both. In any case, performance exceeds NFPA 1720 criteria. Middletown Township should begin collecting and evaluating performance data to develop more definitive conclusions on the factors contributing to this performance.

## Total Response Time Performance

The culmination of the Response Time Continuum is total response time. When citizens call for emergency assistance, this metric represents what they experience as they place the call and wait for help to arrive. Total response time is the amount of time that elapsed from when the call initiated at the communications center until the first emergency unit arrived on scene. NFPA 1720 does not provide a standard for this metric and call processing information was not available at the time of this report.



## 9. CAPITAL ASSETS

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Capital assets include all facilities, all vehicles, and the key support equipment used on the apparatus dedicated to achieving the mission of the fire services in Middletown Township. Facilities and apparatus are the single most expensive infrastructure elements in a fire department. Funding of these elements is difficult to absorb in a single year; therefore, develop plans to address replacement, refurbishment, and maintenance in a multi-year funding strategy, or identify a funding source. Advanced planning of actual expenses will allow an agency time to acquire funds necessary to implement a plan. Regardless of an agency's financial condition, if appropriate equipment is not available for use by responders, it is impossible for a fire department to deliver effective services.

The fire services in Middletown Township maintains a balance of three basic resources that needed to carry out its emergency mission: people, equipment, and facilities. Providing strategic plans for future leaders is part of successful succession planning, and these living documents convey the importance of the department's mission, core values, and goals.

New technology and innovation in the fire service continue to improve the effectiveness and efficiency of the fire service. These plans, reviewed annually, will provide a safer environment for firefighters, and will continue to support the needs of the community.

### Apparatus

There exists within Middletown Township a sizeable fleet of fire suppression and emergency response vehicles. The following figure provides an inventory of fire apparatus, configuration, and condition, ordered by Radio Call Sign.



**Fire Apparatus in Middletown Township**

Radio Call Sign	Apparatus Type	Apparatus Manufacturer	Year	Condition	Status	Other Features
1. Car 9	Expedition	Ford	2008	Good	Front Line	Incident Command area/AED/Water Rescue throw rope/ Extinguishers
2. Chief 7	Tahoe	Chevrolet	2016	Very Good	Front Line	N/A
3. Chief 8	Explorer	Ford	2015	Good	Front Line	N/A
4. Chief 9	Tahoe	Chevrolet	2015	Very Good	Front Line	Incident Command area/Water Rescue/AED
5. Chief 21	Expedition	Ford	2018	Good	Front Line	N/A
6. CP 244	Command Trailer	World Class Trailers	2019	Good	Front Line	Command Post
7. Deputy Chief 7	Expedition	Ford	2008	Fair	Front Line	N/A
8. Decon 21	Trailer	Not Listed	2008	Good	Front Line	Housed at Station 21; owned by Bucks County
9. Deputy Chief 77	Expedition	Ford	2008	Fair	Front Line	N/A
10. Deputy Chief 21	Expedition	Ford	2018	Good	Front Line	N/A
11. Duty Chief	Expedition	Ford	2008	Good	Front Line	Rotates between AC and BCs
12. Duty Car	Expedition	Ford	2008	Fair	Front Line	N/A
13. Engine 21	Engine	Spartan	2008	Good	Front Line	500 Gal, 1500 GPM



# Township of Middletown

Fire Services Study

Radio Call Sign	Apparatus Type	Apparatus Manufacturer	Year	Condition	Status	Other Features
14. Engine 22	Engine	Spartan	2015	Good	Front Line	540 Gal, 1500 GPM
15. Engine 244 / Engine 8	Engine/ Squad	Pierce	2004	Fair	Front Line	Leased from Penndel Fire Company to the Township
16. Engine 244-1 / 77-1	Engine	Pierce	2003	Fair	Reserve Front Line	Leased from William Penn Fire Company to the Township as a back up to Engine 8 500 Gal, 1250 GPM 30 Gal Class B Foam
17. Engine 7	Engine	Spartan / Toyne	2008	Good	Front Line	N/A 500 Gal, 1500 GPM, 30 Gal Class B Foam
18. Engine 77	Engine	Pierce	2016	Very Good	Front Line	N/A 750 Gal, 1500 GPM, 25 Gal Class B Foam
19. Engine 9	Engine	Pierce	2011	Very Good	Front Line	1500 GPM, 750 Gal Tank, 30 Gal Class B Foam Tank
20. Field 21	Field	Ford	2005	Good	Front Line	200 Gal, 150 GPM
21. FM 244	F-350	Ford	2018	Good	Front Line	Command
22. FM 244-1	F-150	Ford	2017	Good	Front Line	On Call Take Home
23. FM 244-3	F-250	Ford	2003	Fair	Front Line	On Call Take Home



Radio Call Sign	Apparatus Type	Apparatus Manufacturer	Year	Condition	Status	Other Features
24. FM 244-4	E-350 Van	Ford	2013	Good	Front Line	Fire Prevention Unit
25. Foam 8	Trailer	Not Listed	2016	Good	Front Line	660 Gallon ARFF & Equipment
26. HazMat 21	Trailer	Not Listed	1996	Good	Front Line	Housed at Station 21
27. Ladder 8	Quint	Pierce	1998	Good	Front Line	Being Replaced
28. Mass Casualty 244	Mass Casualty Trailer	Morgan Olson	2006	Good	Front Line	Mass Casualty
29. Rescue 8	Heavy Rescue	Rosenbauer	2010	Good	Front Line	Pump 2000/5000
30. Rescue 9	Engine-Rescue	Pierce	2014	Very Good	Front Line	1500 GPM, 750 Gal Tank, 30kW Generator, Light Tower, Extrication Tools
31. Rescue Trailer 244	Rescue Trailer	Wells Cargo	2010	Good	Front Line	Trench / Collapse Equipment
32. Special Services 244	Special Service	Levan	2020	Excellent	Front Line	Emergency Services Support
33. Special Services 8	Utility Vehicle	Ford	2015	Good	Front Line	Utility Body and Plow
34. Tac 9	Mini Pumper/Brush Truck	Firematic	2015	Very Good	Front Line	1000 GPM, 380 Gal Tank, 10 Gal Class A Foam Tank,



Radio Call Sign	Apparatus Type	Apparatus Manufacturer	Year	Condition	Status	Other Features
						Severe Off Road capabilities
35. Tac-7	Tac	Pierce	2017	Good Excellent	Front Line	N/A 300 Gal, 1000 GPM
36. Tower 21	Tower	Spartan	2013	Good	Frontline	400 Gal 2k GPM, 100' Tower Ladder
37. Tower 8	Tower Ladder	Pierce	2021	Excellent	To Be Front Line	100" Quint
38. Utility 21	Utility	Ford	2019	Excellent	Front Line	Crew cab w/ utility body
39. Utility 22	Utility	Ford	2011	Good	Front Line	Crew cab w/ utility body
40. Utility 244	Utility	Omaha	2014	Good	Front Line	Fire Investigation Unit
41. Utility 7	Utility	GMC	1994	Fair	Front Line	Personnel Carrier N/A
42. Utility 9	Personnel/ Equipment Carrier	Ford	2019	Very Good	Front Line	Work truck body for misc. equipment

Dynamix Consulting Group observed the vehicles within Middletown Township to be well maintained and generally in fair to good condition. Dynamix Consulting Group evaluated the age of the fleet of apparatus, finding that the units range from a high of 27 years of age (Utility 7) to brand new Tower, which arrives later this year. Almost half of the fleet -21 of 44 vehicles - are ten or more years old. By averaging the total apparatus list, which includes reserve units, and staff vehicles, Dynamix Consulting Group calculates an overall combined average of 9.64 years.

Dynamix Consulting Group noted that when comparing the number of firefighters on duty and on the volunteer rosters to the number of apparatus, Middletown Township is heavy on apparatus. The cost of maintaining apparatus places a significant burden on a fire



department's operating budget in addition to the burden that replacement costs incur on the capital budget. Dynamix Consulting Group recommends a Township-wide evaluation of all the apparatus in the fleet with a goal of eliminating apparatus that does not see regular use and does not serve a specific and necessary need.

## Apparatus Replacement

Fire apparatus are typically unique pieces of equipment, often customized to operate efficiently in a narrowly defined mission. A pumper may be engineered such that the compartments fit specific equipment and tools, with virtually every space on the truck designated in advance for functionality. This same vehicle, with its specialized design, cannot be expected to function in a completely different capacity, such as a hazardous materials unit or a rescue squad. For this reason, fire apparatus is very expensive and offer little flexibility in reuse and reassignment. Thus, communities across the country have sought to achieve the longest life span possible for these vehicles.

Unfortunately, no mechanical piece of equipment lasts forever. As vehicles age, repairs tend to become more frequent, parts more difficult to obtain, and downtime for repair increases. Given the emergency mission that is so critical to the community, this factor of downtime is one of the most frequently identified reasons for apparatus replacement.

Because of the large expense of a fire apparatus, most communities find the need to plan for the cost of replacement. To properly do so, agencies often turn to the long-accepted practice of establishing a life cycle for the apparatus that results in a well-anticipated replacement date. Forward-thinking organizations then set aside incremental funds during the life of the vehicle so that replacement dollars are ready when needed.

The township has been without a funded apparatus replacement plan since the dissolution of the Skyline Fire District in 2012. Across the township, establish plans for the scheduled replacement of these apparatus, including estimated funding requirements.

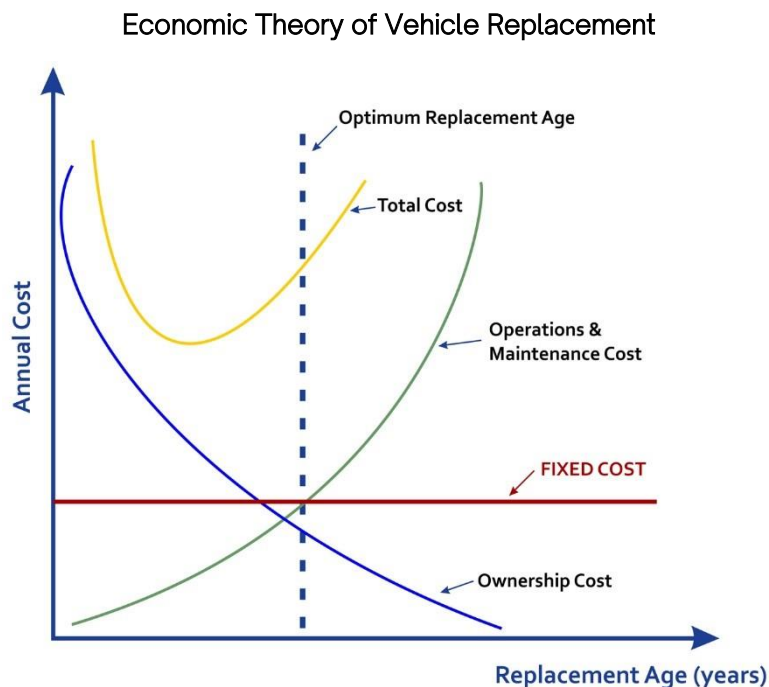
NFPA 1901: *Standard for Automotive Fire Apparatus* is a nationally recognized industry standard for the design, maintenance, and operation of fire suppression apparatus. The committee that develops the standard discussed for many years the issue of replacement cycles. In developing its latest edition, the committee calls for a life cycle of 12 years in front-line service and five years in reserve status for engines, and 15 years in front-line service and five years in reserve status for ladder trucks.

This does not mean that a fire engine cannot be effective as a front-line pumper beyond 12 years. A visit to many departments across the United States will prove that time and time again. Small, volunteer fire departments with only a hundred or so calls per year often get up to 25 years from a pumper, though the technology is admittedly not up to date. Likewise,



busy, downtown fire stations in urban communities move their engines out of front-line status in as little as eight years.

The Economic Theory of Vehicle Replacement is a conceptual model used to create a replacement cycle. The theory states that as vehicles age, the cost of capital diminishes and its operating cost increases. The combination of these two costs produces a total cost curve. The model suggests the optimal time to replace any piece of apparatus is when the operating cost begins to exceed the capital costs. This optimal time may not be a fixed point but rather a range over time. The flat spot at the bottom of the Total Cost curve in the following figure represents the ideal time to replace an apparatus.



Shortening the replacement cycle to within this window allows apparatus replacement at optimal savings to the department. If the department does not routinely replace equipment in a timely manner, the overall reduction in replacement spending can result in a quick increase in maintenance and repair expenditures. Officials who assume that deferring replacement purchases is a good tactic for balancing the budget must understand that two events may occur:

1. Costs are transferred from the capital budget to the operating budget.





2. Such deferral may increase overall fleet costs.

Regardless of its net effect on current apparatus costs, the deferral of replacement purchases unquestionably increases future replacement spending needs.

Dynamix Consulting Group advises clients that on the day of delivery of a new piece of fire apparatus, the agency should start to set funds aside for its replacement. Each piece of fire apparatus and the related support equipment have a predictable expected useful service life, based on a practical balance of use and maintenance cost. By analyzing age, projected service life, and replacement costs with an inflation factor, a replacement schedule can be established that looks farther into the future than simply the annual budget process, enabling the agency to forecast future financial demands and plan more effectively for them.

Dynamix Consulting Group recommends that the fire services in Middletown Township review the current apparatus inventory as well as the apparatus life cycle when establishing an Apparatus Replacement Plan. Base this review on industry best practices and ensure that the current inventory, as well as life cycle of apparatus, meets both the operational and financial requirements of the fire services in Middletown Township.



## Apparatus Lease Program

With the inception of the Department of Fire and Emergency Management responding to emergency calls, the Township entered into an agreement with the Penn del Fire Company to lease Engine 8, known as Engine 244 when staffed by the Department of Fire and Emergency Management during the day. The Township pays the Penn del Fire Company \$20 a year to lease the vehicle for daytime use; the Township also takes on the responsibility of insurance, fuel, repair, and maintenance of the vehicle.

Dynamix Consulting Group recognizes that the lease agreement satisfied the Township’s immediate need for a fire engine when they began emergency response during the day. While this arrangement spared the township the expense of purchasing a new fire apparatus that was not planned for in the budget, Dynamix Consulting Group suggests that due to the age of the leased vehicle and its associated maintenance costs, that the current arrangement is likely not in the long-term best interest of the township. Dynamix Consulting Group will offer alternative options that may provide a more reliable and cost-efficient arrangement for the township in *Long-Term Opportunities and Short-Term Recommendations* section of the report.

### Fire Apparatus Lease Announcement



## Township of Middletown Office of the Fire Marshal

3 Municipal Way Langhorne, PA 19047-3424  
Phone: 215-750-3812 Fax: 215-750-3816  
www.middletowntwpbucks.org



FOR IMMEDIATE RELEASE  
August 14, 2018

#### Innovative Township and Volunteer Fire Companies Collaborate to Provide Consistent Fire Protection; putting the Community First

Middletown Township, Bucks County Pennsylvania – Middletown Township staff has entered into an agreement that will provide firefighting services during the daytime. The Office of the Fire Marshal came to an agreement with the Penn del Fire Company and William Penn Fire Company to lease fire trucks during working hours to respond to fires. The agreement was approved at the August 13, 2018, Board of Supervisors meeting. This marks a significant shift in the focus of the Office of the Fire Marshal, making firefighting a primary job function rather than just support for the fire companies. Fire Engine 244 went into service with Middletown staff at 8:30 a.m. on Tuesday, August 14, 2018.

In December of 2017, the two volunteer fire companies approached the Township to discuss how to provide more consistent responses to daytime emergencies. In recent decades, the number of volunteer firefighters in the region and across the state has dramatically decreased, and finding sufficient coverage during working hours grows increasingly difficult. On July 9, 2018, Fire Marshal Jim McGuire, joined by representatives from both the Penn del and William Penn Fire Companies, led a discussion at the public Board of Supervisors meeting. After this discussion, the final plan was proposed and approved on August 13. All four of the volunteer fire companies serving Middletown were present at this meeting to voice their support for the plan.

The Township will lease a fire truck from the Penn del Fire Company and the William Penn Fire Company for \$20 a year. This apparatus will be used by the Township Fire Marshal Staff during routine and special hours as needed. The Township will also insure the vehicles during the times that they are used by Township staff and it will perform annual maintenance on those trucks. Prior to this agreement, Fire Marshal staff would first report to fire stations to provide support in fire responses. This innovative solution from the Board of Supervisors and the fire companies will instead allow staff to respond to emergencies immediately. Staff will perform their other tasks, including fire prevention, investigations, and inspections, from the fire truck so that they can report directly to an emergency no matter where they are in the community. The community will benefit greatly by having a rapid response from staff and a truck fully equipped for fire suppression, hazardous materials incidents, special rescue situations, and other emergencies. The service will also benefit the boroughs that are currently served by the Penn del and William Penn Fire Companies.

"I want to thank all four of our fire companies for engaging with us in the discussions in the development of these leases and how we can best serve the community," said Board of Supervisors Chairperson Amy Strouse. "We hope that this can be a model for municipalities to partner with their local fire companies to provide a needed service to the community." The fire companies have been critical partners in creating this agreement, and Middletown Township is grateful for their efforts and investment toward community safety.



## Facilities

Appropriately designed facilities provide safe living spaces for personnel and provide an appropriate arrangement for deployment to provide timely service.

Six fire stations make up the fixed facility capabilities of the Fire Service within Middletown Township. The four independent volunteer fire companies own five of the six fire stations that serve Middletown Township. The Township owns the sixth fire station and leases the facility to the volunteer fire company and the emergency squad.

Dynamix Consulting Group observed and reviewed the conditions of the stations during the June 2021 site visit. While this report includes a status of the current conditions of all four buildings, the Township does not have the ability to renovate or request upgrades to the five buildings that it does not own.







In general, the fire stations within Middletown Township stations were in fair to excellent condition and categorized according to the following criteria:

### Fire Station Condition Classifications

Excellent	Like new condition. No visible structural defects. The facility is clean and well maintained. Interior layout is conducive to function without unnecessary impediments to the apparatus bays or offices. No significant defect history. Building design and construction match the building’s purposes. Age is typically less than 10 years.
Good	The exterior has a good appearance with minor or no defects. Clean lines, good workflow design, and only minor wear of the building interior. Roof and apparatus apron are in good working order, absent any significant full-thickness cracks or crumbling of apron surface or visible roof patches or leaks. Building design and construction match the building’s purposes. Age is typically less than 20 years.
Fair	The building appears to be structurally sound with weathered appearance and minor to moderate non-structural defects. The interior condition shows normal wear and tear but flows effectively to the apparatus bay or offices. Mechanical systems are in working order. Building design and construction may not match the building’s purposes well. Showing increasing age-related maintenance, but with no critical defects. Age is typically 30 years or more.
Poor	The building appears to be cosmetically weathered and worn with potentially structural defects, although not imminently dangerous or unsafe. Large, multiple full-thickness cracks and crumbling of concrete on apron may exist. The roof has evidence of leaking and/or multiple repairs. The interior is poorly maintained or showing signs of advanced deterioration with moderate to significant non-structural defects. Problematic age-related maintenance and/or major defects are evident. May not be well suited to its intended purpose. Age is typically greater than 40 years.



Fire Stations within Middletown Township

Fire Station	Picture	Address	Date of Construction	Condition
William Penn Fire Company (Station 7)		123 Main St, Hulmeville, PA 19047	1963	Fair
William Penn Fire Company (Station 77)		1170 Oxford Valley Road, Levittown, Pa	1963	Fair
Penndel Fire Company (Station 8)		220 Centre Street, Penndel, PA 19047	1948	Good
Parkland Fire Company (Station 9)		831 Avenue D, Langhorne, PA 19047	1938	Fair
Langhorne-Middletown Fire Company (Station 21)		114 E Maple Ave, Langhorne, PA 19047	1910	Good
Langhorne-Middletown Fire Company (Station 22)		1741 Langhorne Yardley Road, Langhorne, PA 19047	2010	Excellent

## General Observations

Dynamix Consulting Group observed the fire stations within Middletown Township maintained very well, especially considering the ages of the older buildings. Of special note, among the stations, there did exist a number of “back-in” bays, considered a serious safety concern as many firefighter injuries and accidents occur when backing emergency vehicles into the fire station.

## Automatic Sprinkler Systems

Also, not all of the fire stations within Middletown Township have automatic fire sprinkler systems. NFPA 1: *Fire Code* requires that “New buildings housing emergency fire, rescue,



or ambulance services shall be protected throughout by approved supervised automatic sprinkler systems.” The requirement for sprinkler protection not only protects the emergency services personnel occupying the facility but also reduces the risk of disrupting the provision of emergency services to the community as a result of a fire.

While not required by the code for existing fire stations, Dynamix Consulting Group recommends the installation and proper maintenance of fire sprinkler systems in all existing fire stations for the safety of the firefighters who work in the stations as well as to demonstrate to the community the importance of automatic fire sprinkler systems.

## Future Viability and Replacement

Establish building maintenance plans to ensure the regular maintenance and scheduled replacement of building systems and components such as Heating, Ventilation, and Air Conditioning (HVAC), generators, roofs, driveways, parking lots, painting, and carpet replacement, to keep the stations in good general repair. Establishing a building maintenance schedule will allow the Township to determine a funding source for its fixed facilities.

## Support Equipment

Support Equipment includes self-contained breathing apparatus (SCBA), radios, cardiac monitors, and other assorted high-value equipment. Dynamix Consulting Group observed support equipment that was in service at all six fire stations. The equipment was generally well-maintained and in good condition.

Dynamix Consulting Group noted during the site visit in June 2021 that there is a significant amount of redundancy as it relates to fire equipment within the Township. This is especially apparent with equipment purchased for the Department of Fire and Emergency Management as in many cases, it duplicates equipment that the volunteer fire companies have in service.

Once the mission and vision for the future of the fire service within Middletown Township are established, Dynamix Consulting Group recommends the completion of a comprehensive township-wide equipment inventory. Following completion of the inventory, an evaluation of all equipment should take place to eliminate redundancy and place equipment in the most appropriate locations.

Middletown Township should then coordinate with the volunteer fire companies to ensure annually updated equipment replacement plans, along with an appropriate funding mechanism.



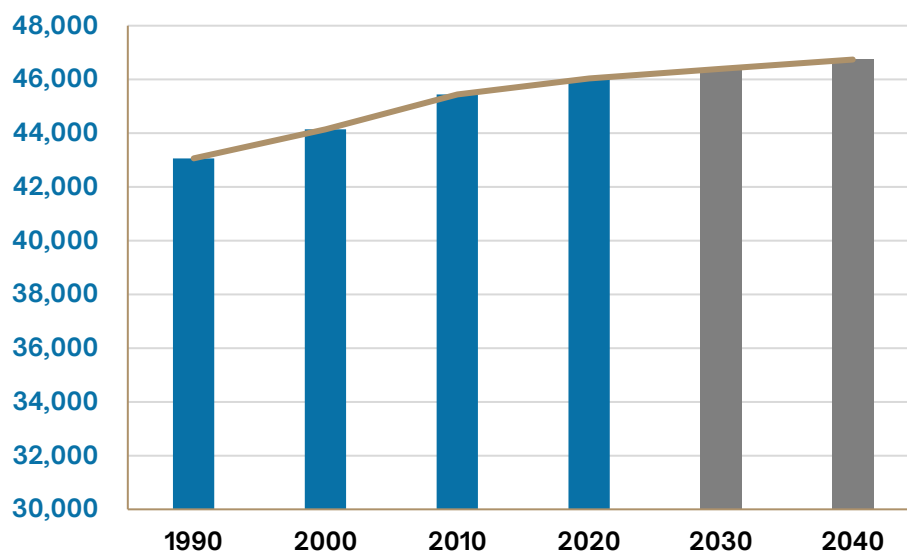
## 10. SERVICE DEMAND PROJECTIONS

Understanding predictions on community changes in the future is an essential part of the planning process. Without some understanding of how Middletown Township’s current levels of service will be affected over time, today’s capital purchase and staffing deployment plans may or may not be adequate in future years. Considerations for current planning and budgeting include the types and intensity of change, the amount of time the change occurs within, and where change occurs. This section includes an examination of future and projected development and their impact to population and demand for services.

### Population History and Growth Projections

The population of Middletown Township has remained stable and with incremental changes in growth for the last 30 years. There has been a general trend decade to decade of increasing the population of the Township and the overall difference in population from 1990 until 2020 was approximately 2,977 or a 6.9% increase over the 30-year period. It is likely that Middletown Township will remain an urban community with a population near 46,000 to 47,000 for the foreseeable future.

Middletown Township Population (1970-2020) and Future Estimates

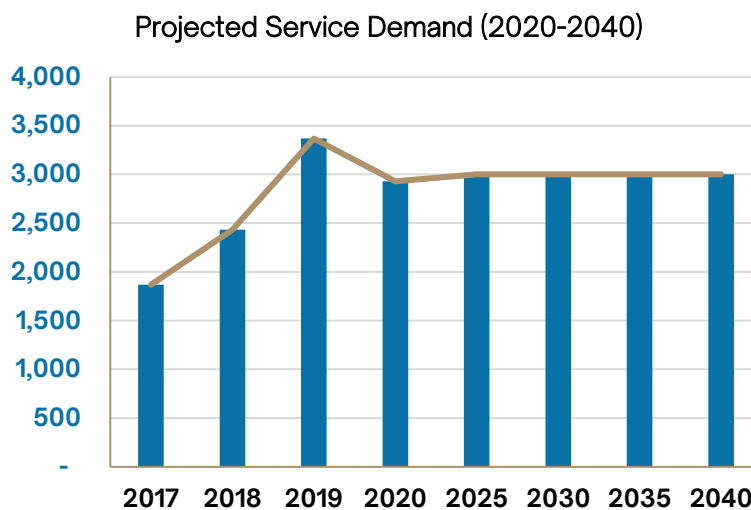




## Service Demand Projections

Several factors can influence the demand for fire and rescue services within a community. Population is often a key indicator as to how demand for services will change over time; however, other factors such as income, access to health insurance, age, and cultural background can influence a community's dependence upon these services.

Beginning in mid-2018, Middletown Township began responding the Fire Code Inspectors to assist the volunteer fire companies during the workweek. While it would be expected that service demand for the volunteer companies would be reduced, as the Fire Code Inspectors responded to calls during the times when demand is at its highest, instead their workload remain relatively constant while the Fire Code Inspectors' demand has doubled year over year.<sup>13</sup> The population and demographics of Middletown Township has not experienced significant change in over 30 years and demands for services should not have increased this dramatically. Furthermore, Fire Code Inspectors routinely self-assign to responses for which they were not assigned and travel outside of the boundaries of the township. While it is anticipated that some responses will occur outside of Middletown Township, the township should define a mission and jurisdictional boundaries and ensure that employees work within the scope of that mission. Projecting forward, it is not anticipated that annual call volume will change and therefore a flat projection is presented to 2040.



<sup>13</sup> For the purposes of comparison of annual demand by emergency responses, in 2020 incidents coded (400 - Hazardous Condition, other) were removed from the dataset as these were voluntary decontaminations of other agencies equipment. This reduced the annual calls entered into the RMS by half.



## 11. ESTABLISHMENT OF PERFORMANCE OBJECTIVES

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There are three main factors that lead to successful mitigation of emergencies; sufficient numbers of well-trained *personnel*, arriving on reliable and well-equipped *apparatus* appropriate to the task at hand, *quickly enough* to make a positive difference in property preserved or lives saved.

The previous sections of this report have laid out the current staffing levels, facilities and equipment, and response performance for the fire services in Middletown Township. The following describes the consequences of failing to deliver sufficient personnel and equipment early enough to mitigate the emergency addressed.

### Dynamics of Fire in Buildings

Most fires within buildings develop in a predictable fashion unless influenced by highly flammable material. Ignition, or the beginning of a fire, starts the sequence of events. It may take several minutes or even hours from the time of ignition until a flame is visible. This smoldering stage is very dangerous, especially during times when people are sleeping, since large amounts of highly toxic smoke may be generated during this phase.

Once flames do appear, the sequence continues rapidly. Combustible material adjacent to the flame heat and ignites, which in turn heats and ignites other adjacent materials if sufficient oxygen is present. As the objects burn, heated gases accumulate at the ceiling of the room. Some of the gases are flammable and highly toxic.

The spread of the fire from this point continues quickly. Soon the flammable gases at the ceiling as well as other combustible material in the room of origin reach ignition temperature. At that point, an event termed “flashover” occurs; the gases and other material ignite, which in turn ignites everything in the room. Once flashover occurs, damage caused by the fire is significant and the environment within the room can no longer support human life. Flashover usually occurs about five to eight minutes from the appearance of flames in typically furnished and ventilated buildings. Since flashover has such a dramatic influence on the outcome of a fire event, the goal of any fire agency is to apply water to a fire before flashover occurs.

Although modern codes tend to make fires in newer structures more infrequent, today’s energy-efficient construction (designed to hold heat during the winter) also tends to confine





the heat of a hostile fire. In addition, research has shown that modern furnishings generally ignite more quickly and burn hotter (due to synthetics). In the 1970s, scientists at the National Institute of Standards and Technology found that after a fire broke out, building occupants had about 17 minutes to escape before being overcome by heat and smoke. Today, that estimate is as short as three minutes.<sup>14</sup> The necessity of effective early warning (smoke alarms), early suppression (fire sprinklers), and firefighters arriving on the scene of a fire in the shortest span of time is more critical now than ever.

The prompt arrival of at least four personnel is critical for structure fires. Federal regulations (CFR 1910.120) require that personnel entering a building involved in fire must be in groups of two. Further, before personnel can enter a building to extinguish a fire, at least two personnel must be on scene and assigned to conduct search and rescue in case the fire attack crew becomes trapped. This is referred to as the two-in, two-out rule. However, if responders know of trapped victims inside the building, they can perform a rescue attempt without additional personnel ready to intervene outside the structure. Further, there is no requirement that all four arrive on the same response vehicle. Many fire departments rely on more than one unit arriving to initiate interior fire attack.

Perhaps as important as preventing flashover is the need to control a fire before it does damage to the structural framing of a building. Materials used to construct buildings today are often less fire-resistive than the heavy structural skeletons of older frame buildings. Roof trusses and floor joists are commonly made with lighter materials that are more easily weakened by the effects of fire. “Light weight” roof trusses fail after five to seven minutes of direct flame impingement. Plywood I-beam joists can fail after as little as three minutes of flame contact. This creates a dangerous environment for firefighters.

In addition, the contents of buildings today have a much greater potential for heat production than in the past. The widespread use of plastics in furnishings and other building contents rapidly accelerates fire spread and increases the amount of water needed to control a fire. All of these factors make the need for early application of water essential to a successful fire outcome.

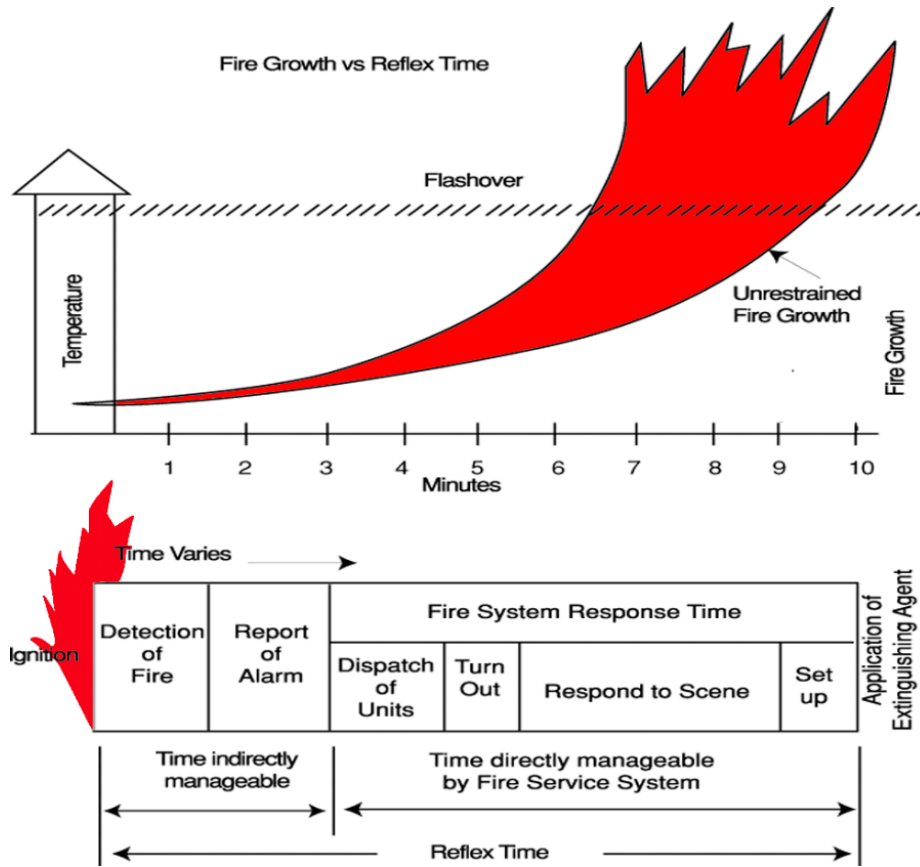
The next figure illustrates the sequence of events during the growth of a structure fire over time.

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<sup>14</sup> *National Institute of Standards and Technology, Performance of Home Smoke Alarms, Analysis of the Response of Several Available Technologies in Residential Fire Settings, Bukowski, Richard, et al.*



### Fire Growth vs. Reflex Time



As is apparent by this description of the sequence of events, the application of water in time to prevent flashover is a serious challenge for any fire department. It is critical, though, as studies of historical fire losses can demonstrate.

NFPA found that fires contained to the room of origin (typically extinguished prior to or immediately following flashover) had significantly lower rates of death, injury, and property loss when compared to fires that had an opportunity to spread beyond the room of origin (typically extinguished post-flashover). As evidenced in the following figure, fire losses, casualties, and deaths rise significantly as the extent of fire damage increases.



Fire Extension in Residential Structures, United States, 2011–2015

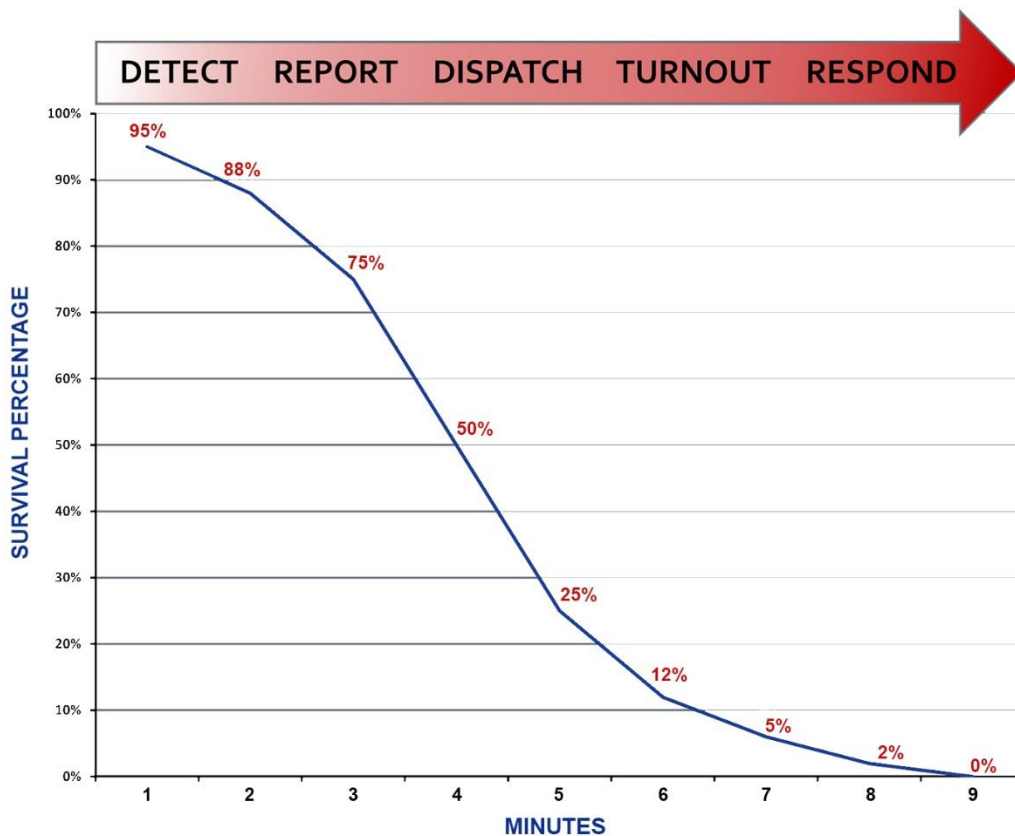
Fire Extension	Rates per 1,000 Fires		
	Civilian Deaths	Civilian Injuries	Average Dollar Loss Per Fire
Confined to room of origin or smaller	1.8	24.8	\$4,200
Confined to floor of origin	15.8	81.4	\$36,300
Confined to building of origin or larger	24.0	57.6	\$67,600

## Emergency Medical Event Sequence

Cardiac arrest is the most significant life-threatening medical event in emergency medicine today. A victim of cardiac arrest has mere minutes in which to receive lifesaving care if there is to be any hope for resuscitation. The American Heart Association (AHA) issued a set of cardiopulmonary resuscitation guidelines designed to streamline emergency procedures for heart attack victims, and to increase the likelihood of survival. The AHA guidelines include goals for the application of cardiac defibrillation to cardiac arrest victims. Cardiac arrest survival chances fall by 7 to 10% for every minute between collapse and defibrillation. Consequently, the AHA recommends cardiac defibrillation within five minutes of cardiac arrest. As with fires, the sequence of events that lead to emergency cardiac care can be graphically illustrated, as in the following figure.



### Cardiac Arrest Event Sequence



The percentage of opportunity for recovery from cardiac arrest drops quickly as time progresses. The stages of medical response are very similar to the components described for a fire response. Recent research stresses the importance of rapid cardiac defibrillation and administration of certain medications as a means of improving the opportunity for successful resuscitation and survival.

### People, Tools, and Time

Time matters a great deal in the achievement of an effective outcome to an emergency event. Time, however, is not the only factor. Delivering sufficient numbers of properly trained appropriately equipped personnel within the critical time period completes the equation.

For medical emergencies, this can vary based on the nature of the emergency. Many medical emergencies are not time critical. However, for serious trauma, cardiac arrest, or conditions that may lead to cardiac arrest, a rapid response is essential. Equally critical is delivering enough personnel to the scene to perform all of the concurrent tasks required



to deliver quality emergency care. For a cardiac arrest, this can be up to six personnel; two to perform CPR, two to set up and operate advanced medical equipment, one to record the actions taken by emergency care workers, and one to direct patient care. Thus, for a medical emergency, the real test of performance is the time it takes to provide the personnel and equipment needed to deal effectively with the patient's condition, not necessarily the time it takes for the first person to arrive.

## Critical Tasks, Risk, and Staffing Performance

The goal of any fire service organization is to provide adequate resources within a period of time to mitigate an emergency event. However, all emergency events inherently carry their own set of special circumstances and require varying levels of staffing based upon factors surrounding the incident. Properties with high fire risk often require greater numbers of personnel and apparatus to mitigate the fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk involved. Common risk categories used in the fire service are:

- **Low Risk:** Areas and properties used for agricultural purposes, open space, low-density residential, and other low intensity uses.
- **Moderate Risk:** Areas and properties used for medium density single family residences, small commercial and offices uses, low intensity retail sales, and equivalently sized business activities.
- **High Risk:** Higher density businesses and structures, mixed use areas, high density residential, industrial, warehousing, and large mercantile structures.

Fire emergencies are even more resource critical. Again, the true test of performance is the time it takes to deliver sufficient personnel to initiate the application of water to a fire. This is the only practical method to reverse the continuing internal temperature increases and ultimately prevent flashover. The arrival of one person with a portable radio does not provide fire suppression capability and therefore should not count as an "arrival" time by the fire department.

## Response Time Performance Objectives

To initiate the process of developing performance objectives, several items must be considered. Although the specific information needed to complete this process will vary with each organization, the following items will generally need to be addressed during this process. Historical call data must be collected and analyzed to determine current performance baselines and identify any gaps in data required; response zones must be



established based on agreed-upon criteria (i.e., population zones, geographic boundaries, etc.); and benchmarks established as goals for these demand zones.

## Current Response Goals

Dynamix Consulting Group emphasizes the importance of establishing and regularly monitoring performance metrics for the deployment of resources. These metrics serve as the foundation for determining whether or not the organization is meeting the expectations of the community that it serves. Without regular and consistent performance evaluation, it is impossible to set and achieve goals established to meet community expectations.

Response standards established by the department must originate from the community served to create a balance between what is desired and what can be afforded. Because of this, Dynamix Consulting Group cannot establish baseline and benchmark performance metrics for a given organization. However, recommendations based upon the analysis conducted throughout this report may be helpful in serving as a starting point for these discussions with the community served or may serve as a reevaluation tool for the organization's current standards.

Response standards are individual to each organization. Multiple factors such as staffing, financial constraints, size of the service area, and political will influence each department's ability to set achievable goals and objectives for response.



## 12. LONG-TERM OPPORTUNITIES & SHORT-TERM RECOMMENDATIONS

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Dynamix Consulting Group does not believe in telling a client what to do, but instead uses a data-driven approach to offer a series of options. Each option includes a description of the associated pros and cons, thus providing policy makers with the information they need to make the informed decisions that best meet the needs of their community.

### Long-Term Opportunities

There currently exist significant opportunities to define the future identity and operations of the fire services in Middletown Township. These are policy decisions that leaders of Middletown Township and its fire services must make.

Dynamix Consulting Group suggests that the most important of these opportunities are the need to define the identity of fire services in Middletown Township and to establish baseline levels of communication and trust.

Once the policy decisions have been made, the members of the fire services in Middletown Township should be empowered make appropriate operational-level decisions that align with these long-term policy decisions.



## 1. Identity of the Fire Services in Middletown Township

Dynamix Consulting Group suggests consideration of the following options for delivery models of the fire services in Middletown Township.

Once a delivery model is selected for fire services in Middletown Township, it is imperative that all levels of the organization, from the newest firefighter to the Township’s elected officials, understand this model. Equally important is the understanding of the mission and priorities of the fire services in Middletown Township so that decisions made at all levels consistently possess the same focus and priorities.

### Options for Fire Service Delivery Models

Options	Pros and Cons
<p><b>Option 1:</b></p> <p>Continue to operate as a dual fire service that separates the volunteer and paid members of the fire service into different systems.</p>	<p><b>Pros:</b></p> <ol style="list-style-type: none"> <li>1. The Township is familiar with this model; maintain the status quo without changes to the management or operations of the fire services.</li> <li>2. The Township budget includes allocations to support this current model of service delivery.</li> </ol> <p><b>Cons:</b></p> <ol style="list-style-type: none"> <li>1. Dynamix Consulting Group repeatedly heard from individuals at every meeting that during the site visit that they considered this <i>Fire Services Study</i> to be their “last chance” to fix the fire services in Middletown Township before too many more people quit and the volunteer fire companies became unsustainable.</li> <li>1. It is Dynamix Consulting Group’s opinion that the current operational model of the fire services in Middletown Township a critical weakness that, if not addressed, will likely result in Middletown Township eventually having to staff a full-time paid fire department without the support of volunteer firefighters.</li> <li>2. Dedicated people make up the fire services in Middletown Township, both volunteer and paid, who provide an outstanding service to the community. It would be significant loss to the community if the volunteer fire companies in the Township were to fail to thrive and eventually discontinue their service.</li> <li>3. While the volunteer fire companies have provided fire service in Middletown Township dating back to 1829, if they were to disappear</li> </ol>





Options	Pros and Cons
	<p>tomorrow, the responsibility for providing this service belongs entirely to the Township.</p> <p>This will add a significant expense to the Middletown Township Budget. For estimating purposes, a community can expect the cost of a full-time paid fire department to be similar to the cost of their full-time paid police department.</p>
<p><b>Option 2:</b></p> <p><b>Operate as a combination fire service that unifies volunteer and paid members into one system.</b></p>	<p><b>Pros:</b></p> <ol style="list-style-type: none"> <li>1. Dedicated people make up the fire services in Middletown, both volunteer and paid, who provide an outstanding service to the community. A combination system will allow the Township to continue to benefit from the service of both the volunteer and paid members of the fire services in Middletown Township.</li> <li>2. There is a widespread feeling among both the volunteer firefighters and paid Fire Code Inspectors that the fire services in Middletown Township requires an immediate intervention. Engaging the members of the fire service in discussions about designing a true combination system provides an opportunity for all stakeholders to work together to create a system that best serves the needs of the community.</li> <li>3. It is Dynamix Consulting Group’s opinion that the current dual fire department operational model of the fire services in Middletown Township a critical weakness. The transition from a dual to a combination system offers the opportunity to create an environment that may be conducive to sustaining active volunteer firefighters further into the future, thereby delaying the need to transition to a full-time paid fire department.</li> <li>4. While the volunteer fire companies have provided fire service in Middletown Township dating back to 1829, if they were to disappear tomorrow, the responsibility for providing this service belongs entirely to the Township. This will add a significant expense to the Middletown Township Budget.</li> </ol> <p>For estimating purposes, a community can expect the cost of a full-time paid fire department to be similar to the cost of their full-time paid police department.</p> <p>The combination model offers the Township the best chance of delaying this transition. Every year that the Township is able to</p>



Options	Pros and Cons
	<p>sustain volunteer firefighters saves the Township from having to fund additional paid fire fighters in the budget.</p> <p><b>Cons:</b></p> <ol style="list-style-type: none"> <li>1. The Township will likely incur an increased personnel cost in order to successfully facilitate changing the management and operations of the fire services in Middletown Township.</li> </ol> <p>Dynamix Consulting Group suggests that if the Township commits to supporting a true combination fire service, that it is necessary fund a full-time executive-level position to oversee the management of this system.</p> <p>The successful candidate for this position should have experience with combination fire services, a working knowledge of the Pennsylvania fire service culture, and be a proven inclusive change-agent with exceptional communication, management, and mentoring skills.</p> <ol style="list-style-type: none"> <li>2. In order for a combination system to succeed within Middletown Township, a dynamic cultural shift will need to occur. This will be a change for everyone associated with the fire services in Middletown Township.</li> </ol> <p>A true combination system will require increased efforts to improve communication, a focus on system-wide coordination, and an investment of time and energy in rebuilding trust and relationships between the Township and the volunteer fire companies.</p> <p>Change is hard. There will need to be a commitment from the Township and the fire services to pursue this path together if it is to be successful.</p>
<p><b>Option 3:</b></p> <p><b>Return to an all-volunteer fire service.</b></p>	<p><b>Pros:</b></p> <ol style="list-style-type: none"> <li>1. The volunteer firefighters in Middletown Township provide an outstanding service to the community.</li> <li>2. An all-volunteer fire service will place less of a financial burden on the Middletown Township budget than either an all-career or combination or dual system that is comprised of both volunteer and paid members.</li> </ol>



Options	Pros and Cons
	<p><b>Cons:</b></p> <ol style="list-style-type: none"> <li>1. The volunteer fire companies in Middletown Township have found themselves, in recent years, challenged to respond to an increasing number of emergency calls with a decreasing number of volunteer firefighters.</li> </ol> <p>An all-volunteer service includes a significant risk that emergency calls could go unanswered because of a lack of availability of volunteer firefighters. The highest demand for calls for service in the Township is on weekdays. This is also the time when most volunteer firefighters are at work and not available to respond to calls.</p> <ol style="list-style-type: none"> <li>2. Trends nationally, within the Commonwealth, and within the Township indicate declining numbers of volunteer firefighters. It is the opinion of Dynamix Consulting Group that this trend will continue, but that removing the support that is presently in place from the daytime response of the fire inspectors will increase the rate at which volunteer firefighters stop volunteering, thereby forcing the transition to a paid fire service sooner than later.</li> <li>3. While the volunteer fire companies have provided fire service in Middletown Township dating back to 1829, if they were to disappear tomorrow, the responsibility for providing this service belongs entirely to the Township. This will add a significant expense to the Middletown Township Budget.</li> </ol> <p>For estimating purposes, a community can expect the cost of a full-time paid fire department to be similar to the cost of their full-time paid police department.</p>
<p><b>Option 4:</b></p> <p><b>Transition to an all-paid fire service.</b></p>	<p><b>Pros:</b></p> <ol style="list-style-type: none"> <li>1. The Township can staff the fire department with paid employees to guarantee consistent response around the clock to emergencies within the community.</li> </ol> <p><b>Cons:</b></p> <ol style="list-style-type: none"> <li>1. Dedicated people make up the fire services in Middletown Township, both volunteer and paid, who provide an outstanding service to the community. It would be significant loss to the community if the</li> </ol>



Options	Pros and Cons
	<p>volunteer fire companies in the Township were to fail to thrive and eventually discontinue their service.</p> <p>2. While the volunteer fire companies have provided fire service in Middletown Township dating back to 1829, if they were to disappear tomorrow, the responsibility for providing this service belongs entirely to the Township. This will add a significant expense to the Middletown Township Budget.</p> <p>For estimating purposes, a community can expect the cost of a full-time paid fire department to be similar to the cost of their full-time paid police department.</p>



## 2. Trust and Communication

Feedback received by Dynamix Consulting Group from member of the fire services in Middletown Township, both during in-person meetings and through the anonymous survey, identified poor communication resulting in a lack of trust as one of the major threats to the future success of the fire services in Middletown Township.

Dynamix Consulting group recommends that Middletown Township make it a priority to establish a baseline level of trust and communication between the Township and the volunteer fire companies by appointing someone specifically charged with these responsibilities.

### Pros:

1. Internal communications were repeatedly identified as a major deficiency within the fire services in Middletown Township during the leadership interviews, member interviews, and in the member survey. Volunteers and employees both requested more engagement from the Township and better, timelier communication.

Dynamix Consulting Group suggests that an immediate first step toward improving communications within the fire services in Middletown Township would be hiring an executive level position and charging this person, with among other things, the creation of a Fire Services Communication Plan. The plan must identify the information to share with various and specific ranks of personnel within the fire services and by what means.

The Communication Plan must then be implemented and consistently followed. The implementation of a Communications Plan manages the expectations of the membership within the fire services in Middletown Township as it relates to the type and quantity of information personnel will receive. This allows for personnel to know where to direct questions they may have related to programs, policies, or other events within the fire services in Middletown Township

2. It is Dynamix Consulting Group's opinion that the current lack of trust and communication are critical weaknesses within the fire services in Middletown Township. Making it a priority to establish a baseline level of trust and communication offers the opportunity to create an environment that may be conducive to sustaining active volunteer firefighters further into the future, thereby delaying the need to transition to a full-time paid fire department.



People do not tend to want to volunteer in places where they do not feel appreciated, communicated with, or where they do not trust those around them. While the volunteer fire companies have provided fire service in Middletown Township dating back to 1829, if they were to disappear tomorrow, the responsibility for providing this service belongs entirely to the Township. This will add a significant expense to the Middletown Township Budget.

For estimating purposes, a community can expect the cost of a full-time paid fire department to be similar to the cost of their full-time paid police department.

Taking immediate steps to improve the baseline level of trust and communications in the fire services in Middletown Township offers the Township the best chance of delaying this transition. Every year that the Township is able to sustain volunteer firefighters saves the Township from having to fund additional paid fire fighters in the budget.

**Cons:**

1. The Township will likely incur an increased personnel cost in order to successfully facilitate improving communications and establishing a baseline level of trust between the fire companies and Middletown Township.

Dynamix Consulting Group suggests that if the Township commits to improving communications and establishing a baseline level of trust between the Township and the fire companies, that it is necessary fund a full-time executive-level position to oversee rebuilding communications and trust.

The successful candidate for this position should have experience with combination fire services, a working knowledge of the Pennsylvania fire service culture, and be a proven inclusive change-agent with exceptional communication, management, and mentoring skills.

2. In order to improve communication and establish a baseline level of trust between the Township and the fire services, a dynamic cultural shift will need to occur. This will be a change for everyone associated with the fire services in Middletown Township.

Change is hard. There will need to be a commitment from the Township and the fire services to pursue this path together if it is to be successful.



## Short-Term Recommendations

Once the aforementioned long-term policy decisions have been made, the members of the fire services in Middletown Township should be empowered make appropriate operational-level decisions that align with those long-term policy decisions. Dynamix Consulting Group offers the following recommendations based on industry standards, best practices, and the experience of the consulting team.

Dynamix Consulting Group has intentionally grouped the short-term recommendations into six categories with the intent that they become the *Major Initiatives* in a Strategic Plan for the fire services in Middletown Township.

Following the adoption of the *Fire Services Study*, or a variation of this study, Middletown Township should assemble an internal Strategic Planning Team to review the findings, identify and prioritize work, and establish the major initiatives to address in the strategic plan.

Dynamix Consulting Group suggests that the Strategic Planning Team should be comprised of a combination of volunteer and paid members who represent all of the volunteer fire companies as well as elected and appointed officials from the Township.

Dynamix Consulting Group has listed the recommendations in order of priority within each of the six categories. The most critical priorities are listed first in each category.



## 1. Personnel Management

### 1.1 Middletown Township should work with the fire companies to facilitate a Strategic Plan.

At the time of this report, there was not a strategic plan in place for the fire services in Middletown Township. Ideally, the leadership of Middletown Township will accept the *Fire Services Study* or some variation of the study. The recommendations, guidance for changes, and new initiatives detailed within the *Fire Services Study* will provide direction for developing a strategic plan. This is the most effective way to prioritize and plan for the implementation of the *Fire Services Study* findings.

### 1.2 Middletown Township should work with the fire companies to establish clear mission and vision statements as well as relevant organizational values for the fire services in Middletown Township.

Dynamix Consulting Group notes that while there exist mission statements, vision statements, and organizational values among the volunteer fire companies and Department of Fire and Emergency Management, no common mission, vision, or values for the fire services in Middletown Township exists.

### 1.3 Middletown Township should reconfigure the Organizational Chart of the Department of Fire and Emergency Management.

Recommendation 2.3 was that Middletown Township should determine whether its Fire Code Inspectors should continue to perform emergency response activities in the future. No matter what the Township decides regarding the future role of the Fire Code Inspectors, Dynamix Consulting Group recommends a reorganization of the Department of Fire and Emergency Management to address the following:

- Reconfigure the Department of Fire and Emergency Management to bring the span of control into a more manageable range. Presently, 17 employees report directly to the Director of Fire and Emergency Management. However, 12 are per diem employees of which only half work on a regular basis. This Director is also responsible for coordinating with the four volunteer fire companies.
- According to the 2017 National Incident Management System, “The optimal span of control for incident management is one supervisor to five subordinates; however,





effective incident management frequently necessitates ratios significantly different from this. The 1:5 ratio is a guideline, and incident personnel use their best judgment to determine the actual distribution of subordinates to supervisors for a given incident or Emergency Operations Center activation.”

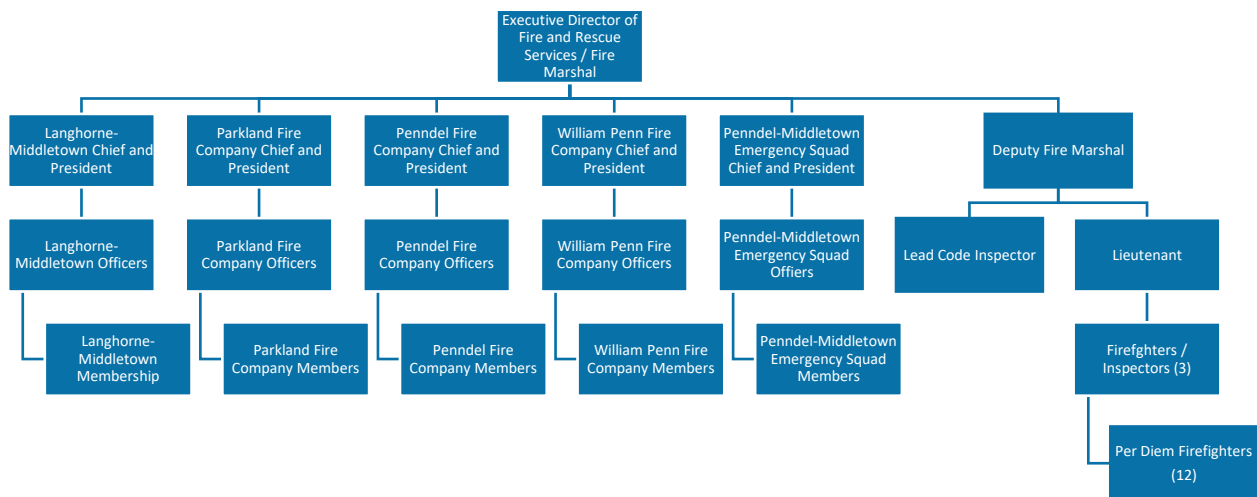
- Dynamix Consulting Group suggests that Middletown Township update its formal organizational structure to include an Executive Director of Fire and Rescue Services/Fire Marshal. This individual would not only serve as the Township’s Fire Marshal, but also as the coordination point for all four volunteer fire companies.
- Dynamix Consulting Group also included the Penn-del-Middletown Emergency Services Squad in this organizational chart. It is the opinion of Dynamix Consulting Group that the Emergency Services Squad would also benefit from improved coordination and communication with the Township. There may also exist the potential for future collaboration between the fire services and the Emergency Squad. Discussions to this effect should be facilitated by the Executive Director of Fire and Rescues Services with the appropriate stakeholders.
- One of the deficiencies in the current organizational structure is the competing priorities of fire prevention and emergency response.
  - This proposed staffing model includes current resources; the only additional position is the recommended Executive Director of Fire and Rescue Services/Fire Marshal. Once Middletown Township establishes the future job descriptions of its Fire Code Inspectors, a determination must be made as to the appropriate number of employees that are needed to perform these functions.
  - The proposed structure creates a Deputy Fire Marshal and a Lead Code Inspector who also assists with administrative functions. These two full-time functions focus on fire prevention and code enforcement.
  - The Deputy Fire Marshal is responsible for the supervision of a Lieutenant and three Firefighters/Fire Code Inspectors. Should the Township determine that the Fire Code Inspectors should respond to emergencies during the day, emergency response would be the primary function of the Lieutenant and one of the Firefighters/Fire Code Inspectors.
  - The remaining Firefighters/Fire Code Inspectors could be assigned dual code enforcement and emergency response duties with a focus on code enforcement if they are directed to only respond to serious calls or calls that occur when the Township’s resources are already committed to other calls.
  - Additionally, the Township could rotate its Firefighters/Fire Code Inspectors between the primary emergency response and primary code enforcement



functions to avoid burnout and to maintain the employee's emergency response and code enforcement skillsets.

- It would be the responsibility of the Deputy Fire Marshal to assign appropriate fire prevention and code enforcement work to the Firefighters/Fire Code Inspectors, with the primary responsibility for responding to emergencies, to complete while on shift.
- The Township should regularly evaluate data and trends as they relate to demand for service and volunteer firefighter activity to determine when it is necessary to add additional Firefighters/Fire Code Inspectors.
- Dynamix Consulting Group suggests the use of Per Diem Firefighters to maintain the daytime emergency response levels when full time employees are out of work.
- Recommendations on the deployment of the Firefighters/Code Inspectors are included in in Section 5 *Service Delivery* Recommendations.
- A sample organization chart for the fire services in Middletown Township that includes these changes is as follows:

Sample Organizational Chart





**1.4 Middletown Township should work with the fire companies to conduct a comprehensive review and update of all of existing policies within the fire service in Middletown Township. Further, these policies should be adopted by all agencies and apply to all members serving Middletown Township.**

Dynamix Consulting Group recommends conducting a comprehensive review of all policies, plans, and protocols currently in place within the fire services in Middletown Township. This review should have a focus of consolidating all existing documents into one set of operating procedures. It should also include an annual gap analysis to identify the need for new rules and regulations to comply with industry standards and best practices.

**1.5 Middletown Township should establish a single Township-wide annual medical evaluation that applies to all personnel who perform fire and rescue activities.**

Dynamix Consulting Group recommends that a single Townshipwide annual medical evaluation program be provided for all personnel who perform fire and rescue activities. This medical evaluation program should comply with NFPA 1582: *Standard on Comprehensive Occupational Medical Program for Fire Departments*.

Additionally, the fire services in Middletown Township should consider emphasizing health and wellness programs for its firefighters and inspectors because of an increased risk for cardiovascular disease and certain types of cancer in the fire service. Prevention programs and health monitoring provide cost savings to fire organizations, reducing workers' compensation costs, sick leave/overtime hiring costs, and improves the overall mental and physical health and wellness of first responders.

**1.6 Middletown Township should establish a Fire Services Safety Committee.**

The committee should align with Chapter 4 of NFPA 1500: Standard on Fire Department Occupational Safety, Health, and Wellness Program. The establishment and empowerment of a safety committee can be one of the best tools to increase the safety of firefighters.



**1.7 Middletown Township should develop a plan to issue all firefighters two sets of turnout gear or to have a stockpile of gear available for firefighters.**

Dynamix Consulting Group recommends that the fire services in Middletown Township develop a plan to issue all firefighters two sets of turnout gear or to have a stockpile of gear within the Township for use when laundering or cleaning primary turnout gear. An additional preventative measure is to limit/reduce firefighter exposure to toxic products of combustion, which occur after the fire (aka, off-gassing).

**1.8 Pre-incident planning within Middletown Township should include both volunteer firefighters and paid Fire Code Inspectors. Additionally, Middletown Township should purchase a software program specifically designed to make the information collection during pre-plans immediately accessible to all firefighters in an emergency.**

Pre-incident planning within Middletown Township should include both volunteer firefighters and paid Fire Code Inspectors. Dynamix Consulting Group recommends that Middletown Township purchase a software program specifically designed to make the information collected during pre-plans immediately accessible to all firefighters in an emergency. Many such programs are on the market including Streetwise, Blazemark, and Raxar among others.

**1.9 Middletown Township should work the four volunteer fire companies to keep the job of the volunteer firefighters “manageable” thus helping the volunteer firefighters maintain a viable volunteer firefighting force for as long as possible.**

Dynamix Consulting Group suggests that if Middletown Township were to engage the leadership of the volunteer fire companies about ways to keep the job of volunteer firefighters “manageable” that the Township would become aware of several ways that it can assist in this effort.



### **1.10 The fire services in Middletown Township should take steps to store all turnout gear in well-ventilated rooms.**

The danger for firefighters does not stop when they extinguish the fire, but returns to the fire stations through their gear, equipment, and vehicles, exposed and contaminated by smoke or other vapors. When contaminated gear and equipment returns to the station via their respective response apparatus, the potential for cross-contamination occurs. Many agencies have developed significant on-scene decontamination procedures intended to minimize the potential for contaminants entering the work environment. While these efforts have a positive impact, additional consideration to the physical design of the fire station minimizes additional exposures. Middletown Township and the fire companies should limit/reduce firefighter exposure to toxic products of combustion, which occur after the fire (i.e., off-gassing).

### **1.11 Middletown Township should purchase and make available a common fire services Record Management System.**

To provide consistent data analysis and management, all companies providing services to the Township should use the same records management system.

### **1.12 Middletown Township should evaluate the use of a survey tool to collect performance feedback of those citizens who have received fire services from any of the fire companies within the Township.**

Middletown Township should evaluate the use of a survey tool to collect performance feedback of those citizens who have received fire services from any of the fire companies within the Township. The gathering of information directly from these individuals will allow fire services, Township, and Township leadership to key in on specific performance issues that allow for intervention in a timelier manner, as well as highlight those performance issues that customers indicate as being of high value.



## 2. Service Delivery

### 2.1 Middletown Township should conduct a full Community Risk Assessment.

The purpose of a Community Risk Assessment is to determine exactly what risks exist in the community, what resources (personnel and equipment) are required to respond to these risks, and what educational or enforcement efforts can be implemented to reduce the number of emergency calls for service.

### 2.2 Middletown Township should minimize the number of apparatus and vehicles that respond to calls; additionally, all call types should be evaluated for response type with only true emergencies including a lights and sirens response.

Middletown Township should adopt a risk-based response and staffing plan. The Middletown Township Fire and Emergency Management Department is routinely deploying more apparatus than it can appropriately staff.

Dynamix Consulting Group recommends that in addition to the established minimum staffing policy, that there be established a minimum crew size for each type of apparatus, with not less than two personnel responding to an emergency call on any type of apparatus.

### 2.3 Middletown Township should evaluate and take action to reduce the 25% of its fire responses classified as “False Alarms.”

One quarter of all emergency responses in Middletown Township between 2017 and 2020 met the “False Alarm” category. Response to emergency calls requires a significant investment personnel and equipment resources. It would be in the best interest of Middletown Township to evaluate these calls in detail and determine if education or code enforcement efforts could reduce the number of False Alarms, thereby decreasing the burden on volunteer firefighter to respond to non-emergency calls and keeping paid employees available to respond to actual emergencies.



## **2.4 If Middletown Township determines that the Fire Code Inspectors will continue to respond to emergency calls during the day, the exact scope of this response must be clearly defined.**

It is imperative that Middletown Township determine the scope of work if the Fire Code Inspectors will continue to respond to emergency calls during the day.

The present response of the fire inspectors has not been well-managed and lacks clear guidance about types of calls and response modes. Additionally, Fire Code Inspectors have been allowed to “self-dispatch” to calls. Response protocols should be established and implemented consistently across the township based on the type, number, and location of the required resources.

Questions that should be addressed include whether Middletown Township will continue to provide automatic response to other municipalities outside of its jurisdiction and how the costs for these services will be provided? Whether the purpose of the daytime response is to provide a basic engine company or if the scope includes advanced rescue responsibilities? Finally, to what extent should these employees be involved in medical response and transport?

The established scope of work will directly impact the number of firefighters employed by the Township as well as the quantity and types of equipment that are necessary.

## **2.5 The Township should consider where employees deploy to emergencies during the day and how these locations correspond to areas of greatest demand during the work week.**

When the current fire station locations and projected travel performance are observed, stations 7, 8, and 21 were clearly sited to serve the boroughs of Langhorne, Langhorne Manor, Pennedel, and Hulmeville at a time when demand in those areas were greatest. Although these stations can and do provide fire services to Middletown Township, these locations are not sited to provide the Township coverage nearly as well as stations 9, 22, and 77.

Dynamix Consulting Group notes that the area of densest incident activity in the general business, commercial, and manufacturing districts lie outside of a four-minute response by any of the existing fire stations.



The current fire station locations are not ideal for providing service to Middletown Township. Dynamix Consulting Group offers the following for short-term consideration while the Township explores long-term opportunities as outlined in Recommendation 5.5.

Station 22 is located within Middletown Township and is also owned by the Township, thus making it better-suited to house daytime firefighters than many of the other fire stations. If the Township were to implement the scenario with two full time employees assigned a primary function of emergency response, it would make sense to deploy those individuals out of Station 22. The two full time employees who are assigned a primary function of code enforcement but respond to serious calls or calls when the Township resources are already committed to other calls could be deployed in a quick-response vehicle that is parked at the Municipal Center.

## **2.6 The Township should consider options such as a staggered schedule where employees report for work at different times to ensure maximum coverage, particularly during peak demand.**

In Middletown Township, service demand begins to climb at 5 a.m., peaks at noon, and sharply tapers off after 5 p.m. The 12-hour block from 8 a.m. until 8 p.m. represents 72.3% of service demand in Middletown Township

The Township may consider options such as a staggered schedule where employees report for work at different times to ensure maximum coverage, particularly during peak demand. An example of this would be half of the employees working from 8 a.m. to 4 p.m. and the other half from noon to 8 p.m., providing maximum coverage during the busiest hours of the day. Another option is a split schedule where half of the employees work from 6 a.m. until 2 p.m. and the other half work from 2 p.m. to 10 p.m. Monday through Friday.

In either case, prior to modifying shift schedules or deployment strategies, the Township must first identify the minimum staffing requirements desired and the hours in which supplemental staffing is needed.

## **2.7 The aging home demographic within the Township provides a need for focused Community Risk Reduction efforts related to smoke detectors within the community.**

Among the residential housing units in Middletown Township, approximately 95% were constructed prior to the year 2000. The aging home demographic within the Township





provides a need for focused Community Risk Reduction efforts related to smoke detectors within the community.

**2.8 Middletown Township should establish “trigger points” related to meeting performance objectives that identify when it is necessary to augment the volunteer fire service with additional paid personnel. Further, plan should be developed to fund the additional personnel.**

The Township should establish performance standards for the volunteer fire companies. These performance standards should include “trigger points” where the Township will supplement the volunteer fire companies with additional paid staff.

If at some point performance declines to a level necessitating paid staff to supplement volunteer companies on weekends and holidays, the Township should be prepared to fulfill that need and maintain reliable delivery of services.

**2.9 Middletown Township should consider adding additional elements to the Records Management System that will allow for the tracking of individual unit and crew response metrics to provide an accurate assessment of crew activity rates.**

Due to the nature of the Records Management System (RMS) used by the Middletown Township fire departments, an evaluation of unit hour utilization was not possible.

**2.10 Middletown Township should require that accurate time metrics including seconds be documented for all responses by all companies moving forward.**

Additional limitations within the data included rounding time stamps to whole minutes. This practice prevents an accurate assessment of performance, depending on how numbers are rounded; nearly two minutes of error could be present for any given metric.



## **2.11 Middletown Township should work with the Bucks County Communications Center to ensure compliance with NFPA 1221.**

Evaluation of the Township's fire companies 2017-2020 data revealed that call processing times are not captured within their records management system. Without this information, neither the fire departments nor the Township can develop an understanding of the call center's performance and ultimately the experience of the caller requesting emergency assistance. Call Processing performance directly affects each fire department's ISO rating, as well as the level of service experienced by the community. Additionally, without an understanding of how the communications center is performing, Middletown Township lacks the information needed to determine if funding provided to the county for emergency communications services is meeting their needs. Middletown Township should regularly request and review Bucks County Emergency Communications performance.

In addition to Call Processing, collect and evaluate data to track Turnout Time Performance, Travel Time Performance and Response Time Performance and Total Response Time Performance.



### 3. Staffing

#### **3.1 Middletown Township should determine whether its Fire Code Inspectors will continue to perform emergency response activities in the future.**

The volunteer fire companies require the assistance of the Township to provide personnel for response during daytime hours. This need is currently being met by responding Fire Code Inspectors for emergency response.

As Teamsters Union Local 107 represents Middletown Township Fire Code Inspectors, once the future rule of the Fire Code Inspectors is determined, the Township should engage the union to update the contract to include appropriate job descriptions, working conditions, training requirements, and compensation levels. If the Fire Code Inspectors are classified as firefighters, they will require training, equipment, medical evaluations, and a variety of other forms of support that are specific to the position of firefighter.

#### **3.2 Middletown Township should begin to collect and evaluate data related to the Indicators for Change.**

While there is no established rule about when a community should consider hiring additional paid firefighters, these Indicators provide guidance for when a community should consider an increase in paid staffing.

Four of the five IAFC Indicators for Change indicate that Middletown Township should begin considering making changes to the current staffing of its fire services. The only indicator that did not directly apply to Middletown Township was Community Aging. While the segment of the population that is most likely to volunteer as a firefighter (ages 18-64) increased 2.55%, the increase in this age range is not translating to an increase in volunteer firefighters.

As the fire services in Middletown Township evolve, change must occur. Effectively managing these changes will require a new level of commitment, planning, and consideration.



### **3.3 Middletown Township should take an active role in advocating for programs and legislation at the federal and state levels that will improve the likelihood of a sustainable volunteer fire service.**

Dynamix Consulting Group suggests that the IAFC recommendations for federal, state, and local levels could all benefit Middletown Township and each of its volunteer fire companies. Because federal and state-level governments are not always able to produce immediate results, Dynamix Consulting Group further suggests that Middletown Township should continue to formalize a combination fire service system with a plan to increase paid staffing if volunteer firefighter activity declines.



## 4. Training

**4.1 Middletown Township should work with the fire companies to development a formal Townshipwide Training Program that consolidates all training requirements in one place, including minimum requirements established by the volunteer fire companies and the Township, OSFC Requirements, and ISO Requirements.**

Dynamix Consulting Group recommends the development of a formal Townshipwide Training Program that consolidates all training requirements in one place, including minimum requirements established by the volunteer fire companies and the Township, OSFC Requirements, and ISO Requirements. This program should provide training requirements for both paid and volunteer firefighters. Dynamix Consulting Group suggests that the inclusion of an online learning platform, such as Target Solutions, would allow for more efficiency and flexibility in training both paid employees and volunteer firefighters and provide a better tracking mechanism to document training.

Dynamix Consulting Group further suggests that there be checks and balances built into the training program to allow both the Township and the volunteer fire companies to ensure that both volunteer firefighters and paid inspectors meet the established training requirements.

**4.2 Middletown Township and the fire companies should consider establishing specific job functions that include associated training and ongoing training requirements that volunteers can satisfy.**

To encourage volunteer firefighting in Middletown Township, Dynamix Consulting Group recommends that specific classifications of volunteer firefighter positions be established along with the commensurate minimum initial and ongoing training requirements based on the duties that each position is authorized to perform.

Industry standard is that firefighter training should be commensurate with duties performed. As such, the more specific a job function is, the simpler it is to establish specific training requirements and ongoing training requirements for that position. As the fire services in Middletown Township have seen a decline in the number of volunteer firefighters in recent



years, it would be beneficial to create specific job functions with associated initial and ongoing training requirements that volunteers can satisfy.

#### **4.3 Middletown Township should facilitate a Townshipwide effort for all volunteer fire companies to be recognized by the Office of the State Fire Commissioner as a Participating Department with a goal reaching 100% participation.**

The Participating Department Recognition Program recognizes fire service certifications at various levels in accordance with nationally recognized and sanctioned Professional Qualification standards. Its purpose is to recognize those organizations that support, promote, and encourage its emergency response personnel to certify voluntarily within the Commonwealth's Certification Program administered by the Office of the State Fire Commissioner.

Dynamix Consulting Group suggests that Middletown Township should facilitate a Townshipwide effort for all volunteer fire companies be recognized as a Participating Department and then to incrementally increase its level with the goal reaching 100% participation.



## 5. Capital Assets

**5.1 Once the mission and vision for the future of the fire service within Middletown Township are established, Dynamix Consulting Group recommends completing a comprehensive Townshipwide equipment inventory.**

Dynamix Consulting Group noted during the site visit in June 2021 that there is a significant amount of redundancy as it relates to fire equipment within the Township. This is especially apparent with equipment purchased for the Department of Fire and Emergency Management as in many cases, it duplicates equipment that the volunteer fire companies have in service.

Once the mission and vision for the future of the fire service within Middletown Township are established, Dynamix Consulting Group recommends completing a comprehensive Townshipwide equipment inventory to align the equipment maintained with the established mission, vision, and values.

Following completion of the inventory, an evaluation of all equipment should take place to eliminate redundancy and place equipment in the most appropriate locations.

**5.2 Middletown Township should evaluate potential alternatives to its current current fire apparatus lease agreement.**

Dynamix Consulting Group recognizes that the lease agreement between the Township and volunteer fire companies satisfied the Township's immediate need for a fire engine when they began emergency response during the day.

While this arrangement spared the Township the expense of purchasing a new fire apparatus that was not planned for in the budget, Dynamix Consulting Group suggests that due to the age of the leased vehicle and its associated maintenance costs, that the current arrangement is likely not in the long-term best interest of the Township.

There are varieties of fire apparatus leasing opportunities including lease-to-own and low-interest financing that can spread payments out over as much as 15 years. During the leasing period, the Township benefits from the use of a newer, more reliable fire apparatus that they will own following the conclusion of the payment plan. This is preferable to the current situation where the Township leases and operates older, sometimes unreliable apparatus, high maintenance expenses, and nothing to show for it at the conclusion of the lease agreement.



Many fire apparatus leasing and alternate funding options exist for municipalities. Dynamix Consulting Group offers the following four websites as a just a representative sample of the options that are available to Middletown Township.

<https://www.piercemfg.com/pierce/blog/fire-truck-leasing-purchase-programs>

<https://www.firetruckleasing.com/>

<https://www.sutphen.com/leasing-information/>

<https://municipal-leasing.com/fire-truck-leasing/>

### **5.3 Middletown Township should work with the fire companies to establish building maintenance plans.**

Establish building maintenance plans to ensure the regular maintenance and scheduled replacement of building systems and components such as Heating, Ventilation, and Air Conditioning (HVAC), generators, roofs, driveways, parking lots, painting, and carpet replacement to keep the stations in good general repair. Establishing a building maintenance schedule will allow the Township to determine a funding source for its fixed facilities.

### **5.4 Middletown Township should work with the fire companies to conduct a Townshipwide evaluation of all the apparatus in the fleet with a goal of eliminating apparatus that does not see regular use and does not serve a specific and necessary need.**

Dynamix Consulting Group noted that when comparing the number of firefighters on duty and on the volunteer rosters to the number of apparatus, Middletown Township is heavy on apparatus. The cost of maintaining apparatus places a significant burden on a fire department's operating budget in addition to the burden that replacement costs incur on the capital budget. Dynamix Consulting Group recommends a Townshipwide evaluation of all the apparatus in the fleet with a goal of eliminating apparatus that does not see regular use and does not serve a specific and necessary need.





**5.5 Prior to investing significant funding into the renovations of any of the fire stations in Middletown Township, consider whether the existing stations are in the optimal locations based on the service demand within the Township’s municipal boundaries.**

Many of the fire stations have outlived their useful life and some are no longer located in the optimal location to meet the current service demands in Middletown Township.

When the current fire station locations and projected travel performance are observed, stations 7, 8, and 21 were clearly sited to serve the boroughs of Langhorne, Langhorne Manor, Penndel, and Hulmeville at a time when demand in those areas were greatest. Although these stations can and do provide fire services to Middletown Township, these locations are not sited to provide the Township coverage nearly as well as stations 9, 22, and 77.

Dynamix Consulting Group notes that the area of densest incident activity in the general business, commercial, and manufacturing districts lie outside of a four-minute response by any of the existing fire stations.

Middletown Township should consider the possibility of relocating, consolidating, or constructing new facilities to meet the Township’s current and future service demands.

**5.6 For future station renovations or construction, the fire services in Middletown Township should consider a design that allows for drive through bays that are large enough to accommodate frontline and reserve apparatus.**

Among the fire stations in Middletown Township, there exists several “back-in” bays, considered a serious safety concern as many firefighter injuries and accidents occur when backing emergency vehicles into the fire station. Drive through bays are the recommended configuration.



## **5.7 For future station renovations or construction, the fire services in Middletown Township should consider a design that includes automatic sprinkler systems.**

All of the fire stations within Middletown Township are not outfitted with automatic fire sprinkler systems. NFPA 1: *Fire Code* requires that “New buildings housing emergency fire, rescue, or ambulance services shall be protected throughout by approved supervised automatic sprinkler systems.” The requirement for sprinkler protection not only protects the emergency services personnel occupying the facility but also reduces the risk of disrupting the provision of emergency services to the community as a result of a fire.

While not required by the code for existing fire stations, Dynamix Consulting Group recommends the installation and proper maintenance of fire sprinkler systems in all existing fire stations for the safety of the firefighters who work in the stations as well as to demonstrate to the community the importance of automatic fire sprinkler systems.



## 6. Finance

### 6.1 Middletown Township should develop a plan to compensate for anticipated future shortfalls of the Pennsylvania foreign fire insurance tax to the volunteer fire companies.

Many relief associations see decreased amounts of aid, due to recent changes in tax collection and disbursement. The fire companies appear to feel the impact, as there was a continued reduction over the last several years. This trend will likely continue and a plan to deal with the shortfall to the fire companies should be developed.

### 6.2 Middletown Township should work with the volunteer fire companies to update their contracts with the Township.

Dynamix Consulting Group suggests that the within the contracts, realistic performance objectives should be tied to funding. *The Establishment of Performance Objectives* section of this report provides the fundamental concepts of establishing fire service performance objectives.

### 6.3 Middletown Township should take the lead in facilitating coordination and planning among the fire companies.

The Township has the expertise to assist the fire companies in accomplishing these various functions.

- Township finance department should assist the companies with establishing appropriate financial reporting and controls.
- A single capital plan should be collaboratively developed and reviewed annually.
- Review agreements for compliance and relevance.
- Complete audits or financial reviews of each company.



#### **6.4 Middletown Township should work with all the volunteer fire companies to develop a consolidated capital plan with funding sources for the retirement, funding, and replacement of apparatus and capital equipment.**

Dynamix Consulting Group recommends that the fire services in Middletown Township review the current apparatus inventory as well as the apparatus life cycle when establishing an Apparatus Replacement Plan. Base the review on industry best practices and ensure that the current inventory, as well as life cycle of apparatus, meets both the operational and financial requirements of the fire services in Middletown Township.

#### **6.5 Middletown Township should perform annual audits of the fire companies.**

This will be new expense, but the benefit of knowing how companies use taxpayer funds is important. Middletown Township typically contributes approximately \$1.1 million a year to the volunteer fire companies. However, the majority of these funds are not subject to auditing. The Commonwealth does audit the pass through Foreign Fire tax, but that is distinctly different from auditing funds contributed by the Township.

#### **6.6 Closely monitor Middletown's growing OPEB liability and take into account in future budgets.**

The pension funds are appropriately funded with a discount rate of 7%, generally regarded as reasonable. Police are currently contributing 5.75% of salaries to their defined benefit plan. Other fulltime Township employees contribute 5% to a defined contribution pension plan. A concern of note is the growing Other Post-Employment Benefits (OPEB) liability. As of 12/31/19, the net liability was \$12,579,021. Middletown Township is on the pay as you go method, which only funds the expense as it occurs. Ideally, OPEB should be treated like a pension liability and funds invested to offset the liability. Few municipalities have initiated proactive OPEB funding, so Middletown Township is not the exception to this practice; however, monitor this growing liability closely and consider with future budgets.



6.7 Article 1803 of the Second Class Township Code requires fire companies to submit an annual report to the Board of Supervisors on the use of appropriated funds before any further payment can be made to the company.

Middletown Township should ensure that these reports are received and provided in a standardized format.



## 13. DYNAMIX CONSULTING GROUP



Dynamix Consulting Group was founded on Mary-ellen Harper and Stuart McCutcheon's shared vision of helping fire departments use their data to deliver the best possible service to their communities. We pride ourselves in developing reports that describe complicated concepts in simple terms. Our reports are specifically designed to explain fire and emergency services concepts to the general public.

Inspired by the place where structure meets dynamic.

### Dynamix Consulting Group

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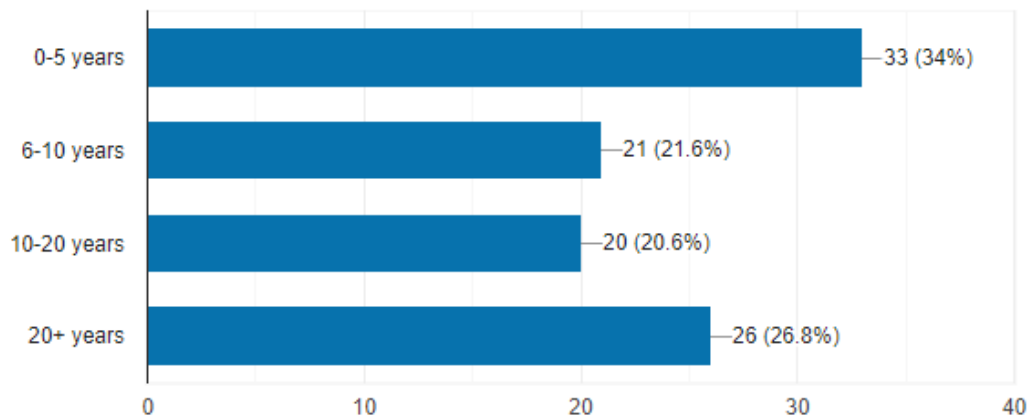


## APPENDIX A: FIREFIGHTER SURVEY

The following includes a list of the most common comments for each question. Middletown Township received a complete copy of all responses.

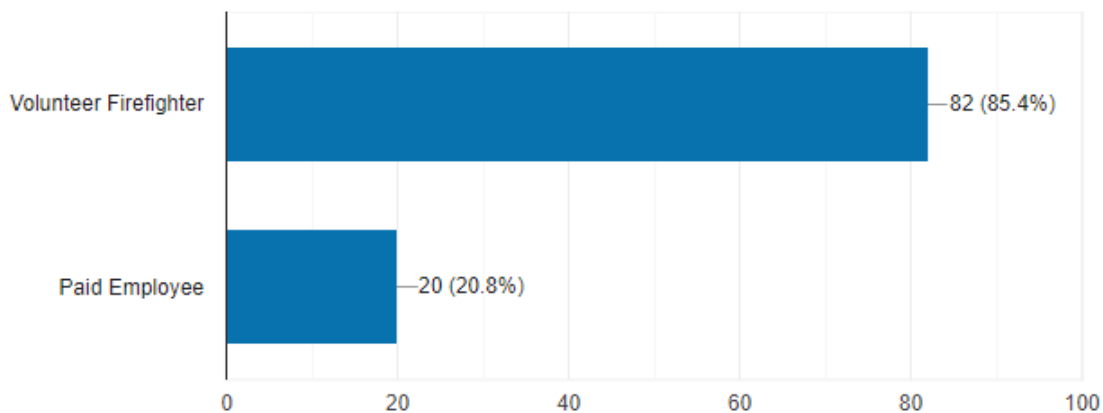
### 1. Please identify your total number of years of service as a firefighter in Middletown Township area.

97 responses



### 2. Which one of the following best describes your current position?

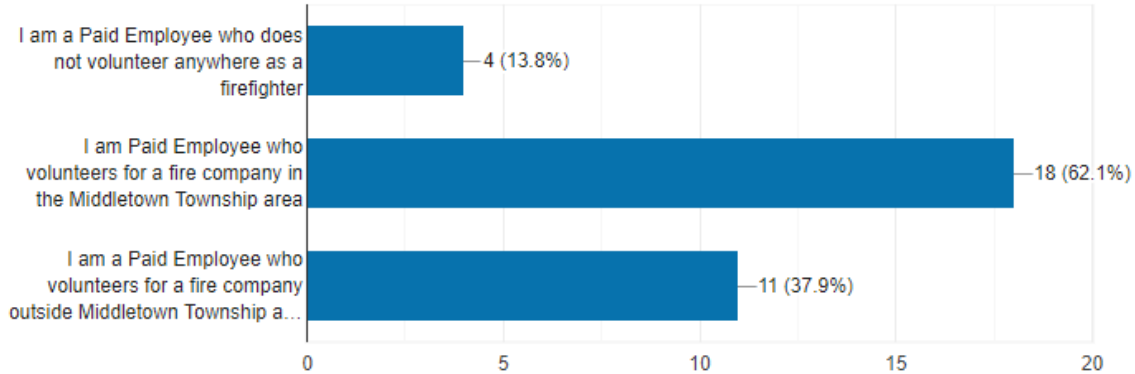
96 responses





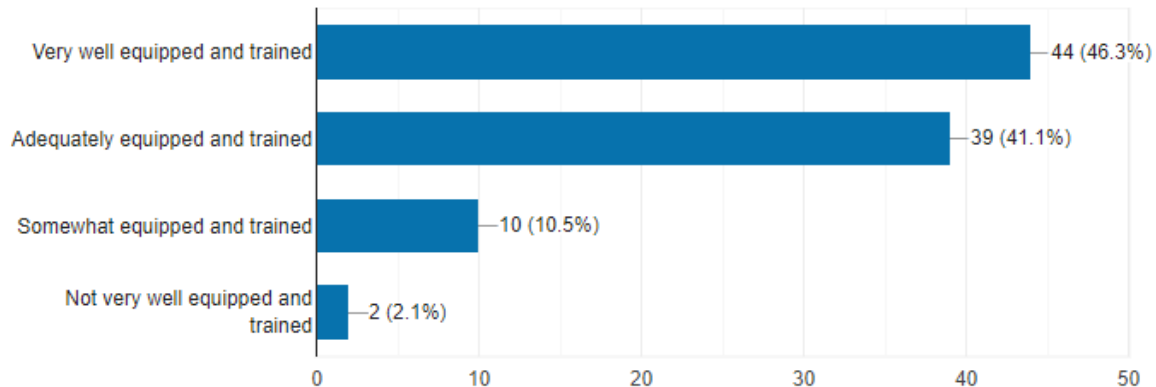
### 3. If you are a Paid Employee, which statement most accurately describes you?

29 responses



### 4. To what level do you feel equipped and trained to respond to emergencies in the community?

95 responses

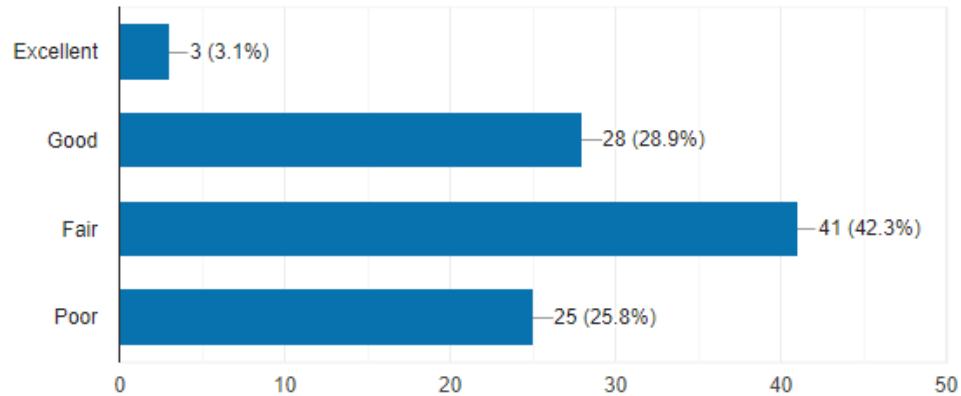






### 5. How would you rate morale within the fire service within Middletown Township?

97 responses



### 6. What suggestions do you have for improving morale within your fire department and Middletown Township?

82 responses

A more cohesive training regimen with Township, and company fire fighters.

More genuine collaboration between the fire departments and the Township. The Township should appoint a liaison dedicated to the Townships emergency services in general to coordinate resources and funding to better serve the citizens. The person should assist with grants and general grievances within the Township to help facilitate a harmonious relationship conducive to a one Township one team model. This would also include the suggestion of not purchasing duplicate resources wasting the tax payers money. The Township has not been forthcoming with information. The fire marshal's office has been mediocre at best at providing information in a timely manner. These all create a hostile environment which fractures already fragile relationships and causes stress to volunteers who already have normal life stress to deal with. This causes the loss of good members which hurts morale within the Township and fire departments as a whole.

Better communication between the fire company and the Township.

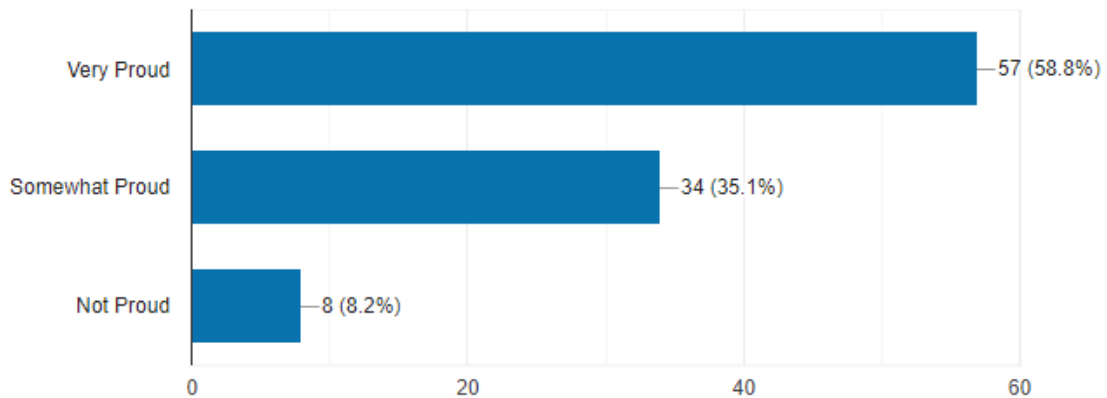
More manpower, more collaborative training between departments, standardized operating procedures, standardized equipment (i.e., hose line sizes, equipment, operations on firegrounds, etc.)

The Middletown Township elected leaders and Township Manager need to make a truly genuine effort to work with all four volunteer fire companies and totally revamp the operation of Middletown Township Department of Fire and Emergency Management.



7. How proud are you to tell other people that you are a member of the fire service within Middletown Township?

97 responses



8. If you could change only one thing about your work environment, what would it be?

79 responses

Buddy boxes

Having a Township training facility similar to the Bensalem Township training center would improve Township fire department's abilities to train as a department and also train with other departments within the Township. This is currently done on an opportunity driven model of acquired structures which is not enough in today's fire service. As I said above more communication between the Township and fire departments. More professional relationships. This of all things is a business and should be treated as such by all parties.

Make us firefighter not inspector

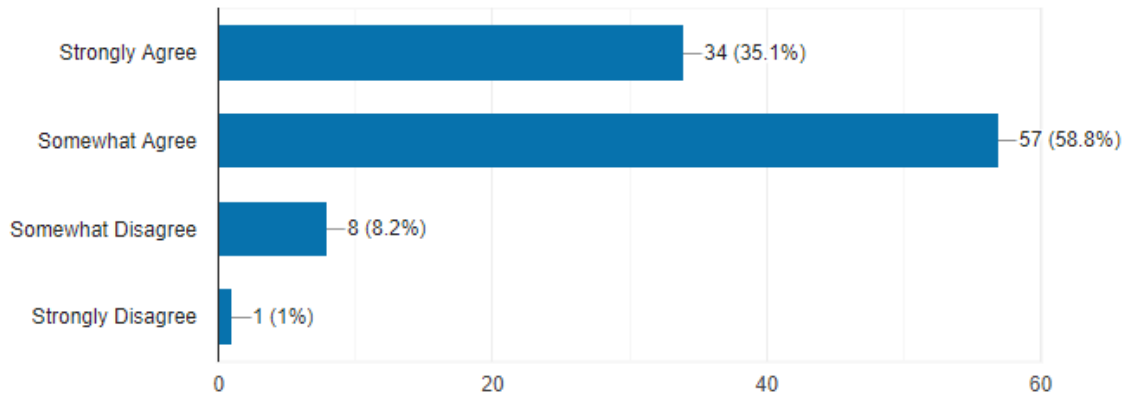
I would like to see a more effective, beneficial, and trustworthy relationship with Middletown Township and subsequently the Department of Fire and Emergency Management employees.

Addition full time employees. At least 3 on the engine per day.



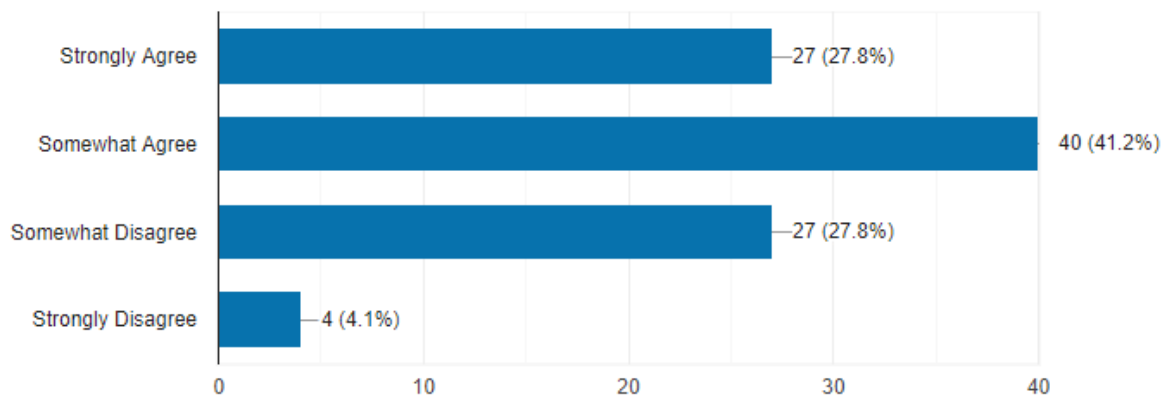
9. Please identify your level of agreement with each of the following statement. The fire service within Middletown Township is respected by the community that it serves.

97 responses



10. Please identify your level of agreement with each of the following statement. The fire service within Middletown Township is sufficiently engaged in the community.

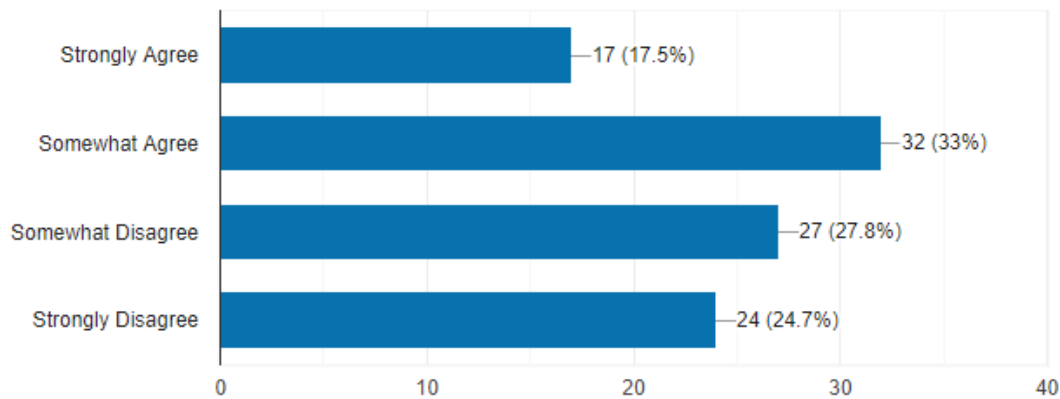
97 responses





11. Please identify your level of agreement with each of the following statement. The leadership of the fire service within Middletown Township strives to maintain cooperative working relationships with neighboring emergency service providers.

97 responses



12. In your opinion, what is the greatest strength of fire service within Middletown Township?

Dedication of the volunteers and employees.

The diversity of backgrounds within the Township. We have blue collar and white collar folks. This greatly assists in running the administrative side of the fire service which can sometimes be improperly managed due to lack of experience or general knowledge of business dealings. The membership numbers within the Township believe it or not seems to be better than some other Townships are faring.

Pride in service.

Having carrier staff on duty day time to supplement lack of volunteers is the greatest strength within Middletown Township, unfortunately the program lacks clear direction and goals, the fire marshal doesn't want to hurt fire chiefs feelings so he constantly skirts around the political aspects of individual fire companies. A fire chief is needed to organize response districts, standardize equipment and policies.

Very well equipped



**13. In your opinion, what is the single greatest future opportunity for the fire service within Middletown Township?**

81 responses

Fully staffed apparatus with trained personnel to protect the citizens of Middletown Township.

Township fathers/elected officials using the results and suggestions of this survey as a springboard to jump the fire/emergency services to be the best in Bucks County.

One single command structure for fire and EMS should be established. Too many people in charge right now. Leads to confusion.

Future opportunity is to promote and retain Volunteers - Township and State must help. They HAVE to be an advocate for us. We cannot do it all by ourselves. Look at the social /economic region we live in. Most of us are professionals, we have a couple of shift workers and they are generally younger members that still live with parents. In order to retain younger members, there must be some sort of Township Wide incentive for all members that may assist younger members to stay within the area.

Merger of companies, one leadership, less stations and equipment. We need to be smart on how to spend and save money

**14. In your opinion, what is the single greatest threat to the fire service within Middletown Township?**

89 responses

The leadership

To not make changes with the current leadership in the fire marshal's office and not make the volunteers a priority.

Failure to communicate between The Township and Middletown Township companies

There are not enough volunteers. More cooperation is needed between the supervisors and the Fire Marshall's office.

That Middletown Township does nothing with this study like what happened with the last study the Township did 40 years ago. If they took action back then we may not be talking about this study now!



**15. Please use the space below to tell us your suggestions or final thoughts for improving the fire service within Middletown Township.**

67 responses

The daytime program is in need of full Township support. In the beginning tension were extremely high with the police due to lack of/or poor communication. We are Fire Code Inspectors, riding a fire truck going to fire/EMS calls. Additionally, we are not a fire department (which the Township is adamant about). How do you explain this and have it make sense?

Control unnecessary spending of rescue equipment which is duplicating equipment that is already on two rescue trucks in the Township. Utilize the money on PPE for the career staff. Get back to basics of being an Engine Company which was the intent of the program when presented to Township Supervisors. Trying to do too much with very little staffing!

I would like to see a more structured approach to engaging with the community, taking on new recruits, and inner company training. Solidifying these 3 pillars will ensure that we stay competent in our duties and stay strong enough to perform them.

I think the leadership needs to be managed better. There needs to be communication between the Township and the fire departments in a way that we can all hear what is being said. Not whisper down the lane and hear things from others outside neighboring departments. Also control on fire grounds and doing what your assigned. The departments and Township need to work together to complete the task we all signed up for and that is to serve and protect the citizens of Middletown Township.

I am a contributing member of a volunteer fire company who was very involved in an administrative role. Over the years, I have witnessed the frustrations and time that had to be devoted to dealing with Township issues and problems which never seems to get resolved. This has taken a toll on many members of our fire company which has resulted in a major decline in their moral and participation. I would place myself in this category. I am still willing to help out with various tasks, but it has become more difficult for me to have the desire due to the way that the volunteers are treated. I am also concerned about the way that the fire marshal's office operates and the excessive spending of the taxpayers' money. I have more insight than my friends and neighbors as to how emergency services should operate. If the residents of this community really had an understanding of the problems in the Township, there would be a change with the Township supervisors come election time and hopefully a new Township manager. There is no question that there needs to be a major change within the fire marshal's office.